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May 26, 1988
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U.S. Nuclear Regulatory Commission
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Re: Pilgrim Nuclear Power Station Management
Self-Assessment of Readiness to Restart Report
and Restart Plan, Volume 2, Revision 2

Dear Sir:

This letter transmits the Pilgrim Nuclear Power Station (PNPS) Self-Assessment of Readiness for Restart Report and the PNPS Restart Plan, Volume 2, Rev. 2. The Self-Assessment of Readiness for Restart Report describes both the process and the conclusions of the Restart Readiness Self-Assessment (RRSA) by Boston Edison Nuclear Organization management. The Restart Plan, Volume 2, Rev. 2 is the second installment of updated results for the Restart Plan. As such, the Restart Plan, Volume 2, Rev. 2 supersedes the first revision submitted by letter of October 26, 1987.

The process and results of the RRSA have confirmed the appropriateness and viability of the Restart Plan. Only limited changes to the Restart Plan description are necessary to reflect current implementation at PNPS. These changes are reflected in Chapter IV of this report (changes to organizational structure and personnel) and in Chapter V.A.1, V.B.1, and V.D.2 of this report (changes to Restart Plan, Volume 1, Chapters II, III, and IV implementation). Changes to Appendix 10 of Volume 2 of the Restart Plan are identified in Appendix 11 of Volume 2, Rev. 2.

Schedules for actions to address the matters identified in Chapter II.A of the Self-Assessment for Restart Report will be provided to the NRC by separate correspondence requesting commencement of the NRC's team inspection.

Please feel free to contact me or R.A. Ledgett if you have any questions or need additional information concerning the Self-Assessment of Readiness for Restart Report or the Restart Plan results.

R.G. Bird

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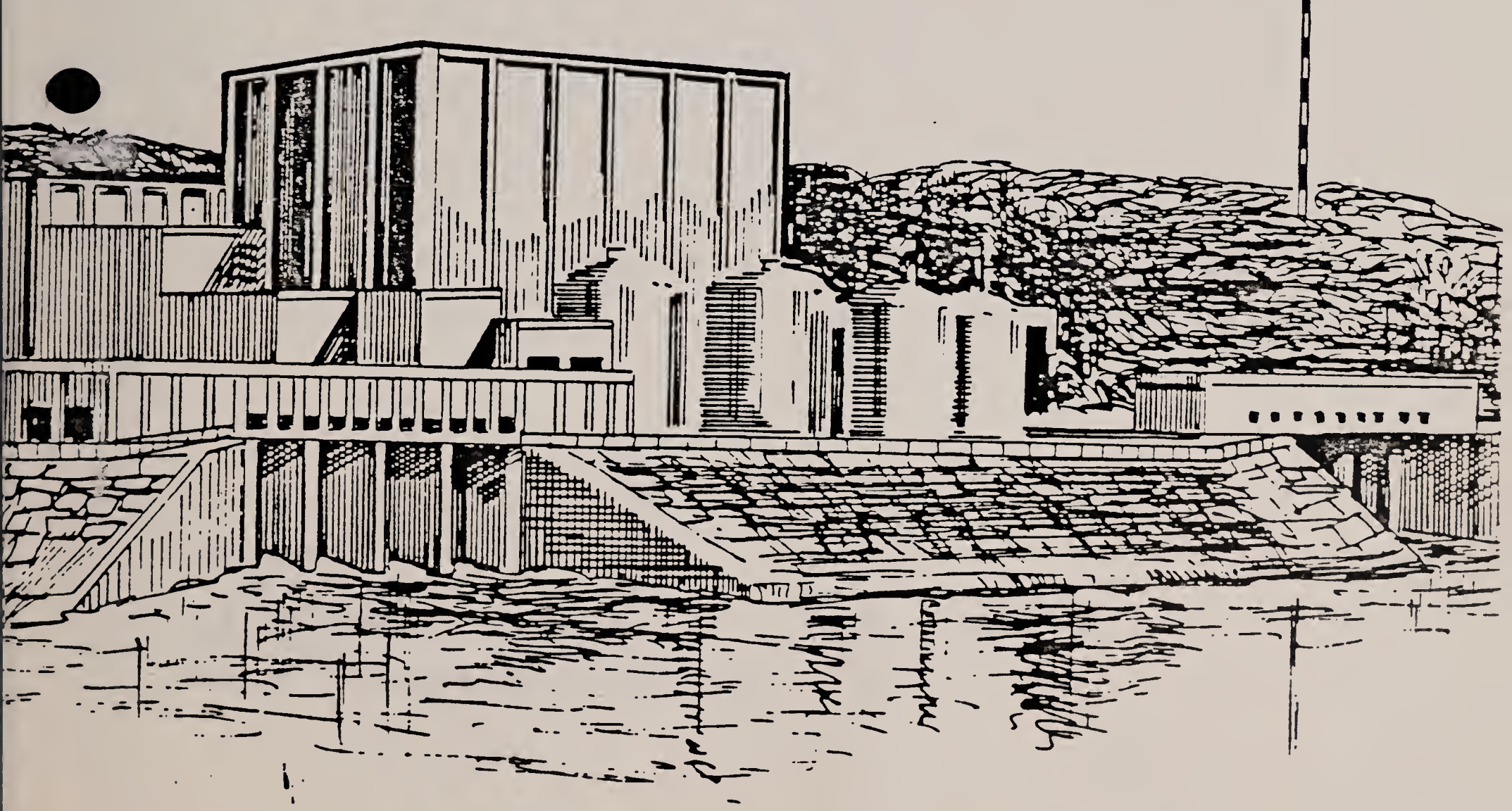
SELF ASSESSMENT OF READINESS FOR RESTART



BOSTON EDISON

PILGRIM NUCLEAR POWER STATION

SELF-ASSESSMENT OF READINESS FOR RESTART

APPROVED:

R.G. Bird

Date: 5/26/88

R.G. Bird
Senior Vice President - Nuclear

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LIST OF ACRONYMS

ALARA	-	As Low As Is Reasonably Achievable
ARP	-	Alarm Response Procedure
ASME	-	American Society of Mechanical Engineers
BEQAM	-	Boston Edison Quality Assurance Manual
BWR	-	Boiling Water Reactor
CAL	-	Confirmatory Action Letter
CCTV	-	Closed Circuit Television
COE	-	Chief Operating Engineer
DC	-	Direct Current
DR	-	Deficiency Report
EOP	-	Emergency Operating Procedure
EPG	-	Emergency Procedure Guideline
ESF	-	Engineered Safeguards Feature
F&MR	-	Failure and Malfunction Report
FRN	-	Field Revision Notice
FSAR	-	Final Safety Analysis Report
GPU	-	General Public Utilities
HP	-	Health Physics
I&C	-	Instrumentation and Control
IDS	-	Intrusion Detection System
ILRT	-	Integrated Leak Rate Test
INPO	-	Institute of Nuclear Power Operations
IROC	-	Independent Radiological Oversight Committee

LCO	-	Limiting Condition for Operation
LLRT	-	Local Leak Rate Test
LSFT	-	Logic System Functional Test
M&TE	-	Measuring and Test Equipment
MCIAP	-	Material Condition Improvement Action Plan
MOP	-	Mission, Organization and Policy Manual
MR	-	Maintenance Request
MSIV	-	Main Steam Isolation Valve
MSTP	-	Master Surveillance Tracking Program
NAO	-	Nuclear Auxiliary Operator
NCR	-	Non-Conformance Report
NED	-	Nuclear Engineering Department
NOP	-	Nuclear Organization Procedure
NOS	-	Nuclear Operations Supervisor
NPRDS	-	Nuclear Plant Reliability Data System
NRC	-	Nuclear Regulatory Commission
NSRAC	-	Nuclear Safety Review and Audit Committee
NWE	-	Nuclear Watch Engineer
ORC	-	Operations Review Committee
PDC	-	Plant Design Change
PET	-	Performance Excellence Team
PNPS	-	Pilgrim Nuclear Power Station
POD	-	Plan-of-the-Day
PWT	-	Post-Work Testing
QA	-	Quality Assurance
QAD	-	Quality Assurance Department

QADR	-	Quality Assurance Deficiency Report
QAR	-	Quality Assurance Recommendation
QC	-	Quality Control
RAP	-	Radiological Action Plan
RETS	-	Radiological Environmental Technical Specifications
RIP	-	Radiological Improvement Program
RFO-7	-	Refueling Outage No. 7
RO	-	Reactor Operator
ROR	-	Radiological Occurrence Report
RP	-	Radiation Protection
RRSA	-	Restart Readiness Self-Assessment
SALP	-	Systematic Assessment of Licensee Performance
SED	-	Systems Engineering Division
SEP	-	Safety Enhancement Program
SRO	-	Senior Reactor Operator
STA	-	Shift Technical Advisor
Team	-	Management Oversight and Assessment Team
WIP	-	Workforce Information Program
WPRT	-	Work Prioritization Review Team
WSRC	-	Work Scope Review Committee

I. INTRODUCTION AND SUMMARY

In response to the United States Nuclear Regulatory Commission (NRC) Regional Administrator's August 27, 1986 letter to Boston Edison Company, this report contains an overview and summary of Boston Edison's Restart Readiness Self-Assessment (RRSA) for the Pilgrim Nuclear Power Station (PNPS). This Introduction and Summary presents an overview of the RRSA conclusions and a brief description of: (1) the events leading up to, and establishing the context for, the RRSA; (2) the process used to develop and implement the RRSA; (3) the contents and organization of this report; and (4) the results and conclusions of the RRSA.

A. Overview of RRSA Conclusions

The RRSA has confirmed the appropriateness and validity of Boston Edison's Restart Plan which was submitted by Boston Edison on July 30, 1987. The NRC acknowledged the viability of the Restart Plan, and accepted it as a suitable framework for responding to the NRC's request for a self-evaluation of restart readiness.

The RRSA has identified the following matters relating to plant and equipment performance, operations performance, and management and organization which show significant improvement but which require completion of specific, well-defined actions for restart: material condition and cleanliness; maintenance; planning and scheduling; plant testing and readiness; system

lineups; operations performance; formality of communications; procedure adequacy; drawing completeness and accuracy; and institutionalization of site work practices. Schedules for actions to address these matters will be provided to the NRC by separate correspondence requesting commencement of the NRC's team inspection.

The RRSA found an improved performance trend in the functional areas of radiological controls, surveillance, fire protection, security, and assurance of quality, all of which were identified as areas for increased attention by the NRC's 1986 Systematic Assessment of Licensee Performance (SALP) report (86-99). Subject to closure of the remaining actions identified by PNPS line management, Boston Edison will have resolved the issues identified in the SALP 86-99 report.

The results of Boston Edison's independent performance evaluations indicate that the peer evaluation process and the Quality Assurance (QA) surveillance monitoring program have proven to be valuable tools that facilitate the assessment process and are useful adjuncts to existing line management monitoring processes.

The plan for transition from the restart organization to a long-term nuclear organization has been developed and essential elements of the long-term organization have been implemented. Substantial nuclear management experience and expertise have been added to the organization in key positions;

although full Boston Edison manning of the expanded maintenance section is still required.

The RRSA confirmed the appropriateness and validity of the bases for self-assessment of readiness that were established in Chapter V of the Restart Plan. Those bases for assessment of readiness for restart have been substantially met.

Boston Edison has concluded that, upon completion of the actions identified in the RRSA and the Restart Plan, PNPS will be ready for safe and reliable restart and continued operation.

B. Background

Since August 1986, Boston Edison has been engaged in an extended outage, during which PNPS has been refueled, substantial physical and procedural modifications have been made to enhance safety and reliability and to assure compliance with increased regulatory requirements, and remaining physical work and sequenced testing have proceeded and continued toward a final state of readiness for restart.

On a parallel path and throughout the course of the outage, Boston Edison has undertaken extensive efforts to assist cognizant Commonwealth of Massachusetts and town agencies in upgrading offsite emergency plans and preparedness for PNPS. The physical and procedural modifications and offsite emergency planning efforts are the subject of separate correspondence and reports.

On another parallel path, a series of self-assessments by Boston Edison has resulted in programs, plans, and actions to meet rising standards of excellence, to improve management of PNPS activities, and to assure safe and reliable restart and continued operation of PNPS. This report focuses upon Boston Edison's RRSA process and management's evaluation of these programs, plans, and actions.

The RRSA process which is reflected in this report had its genesis in internal reviews and a fundamental decision by Boston Edison to proceed into a refueling outage which had been scheduled to start at a later date and, in parallel, to make a major commitment to develop and implement programs, plans, and actions to meet rising standards of excellence, improve management, and assure safe and reliable restart and continued operation of PNPS. The resulting Boston Edison nuclear management reviews produced programs, plans, and actions to reduce work backlog and to address and resolve issues in certain areas where the NRC had expressed ongoing programmatic concerns. Further review by the highest levels of management led to hiring as Senior Vice President - Nuclear an individual with substantial expertise and experience and a proven track record of success in naval nuclear power operations and management.

By March 1987, the new Senior Vice President - Nuclear was in place at the PNPS site and took charge of the restart effort. Under his direction, Boston Edison then undertook a series of assessments leading to the Restart Plan, which was

submitted to the NRC on July 30, 1987, and culminated in the RRSA to which this report is addressed. This series of assessments included:

(1) An evaluation of the management practices at PNPS, which was later summarized and presented to the NRC by the Senior Vice President - Nuclear at a September 24, 1987 public meeting. It identified the need at PNPS for improved standards, plans, and controls, including methods of measuring performance against those standards, with particular emphasis on recognizing and meeting an evolving and rising standard of excellence in nuclear activities. This emphasis on attaining standards of excellence set the benchmark and tone for subsequent assessments. It also identified and confirmed a set of basic strengths at PNPS. These included competent reactor operators and a strong engineering capability, with the latter evidenced by the results of the safety system functional inspections conducted by both the NRC and Boston Edison, and by the rating of "1" in SALP 86-99 for engineering support in February 1987.

(2) An evaluation of the programs, plans, and actions necessary for restart by Boston Edison's senior Nuclear Organization management, which was later

embodied in the July 30, 1987 Restart Plan. The Restart Plan integrated and described the necessary programs, plans, and actions, and also defined the specific bases that Boston Edison management had determined to be appropriate for: [1] addressing programmatic concerns expressed by the NRC prior to the outage; and [2] assessing readiness for restart.

(3) In-depth assessments of maintenance and radiological controls, which have resulted in the development and implementation of improvement action plans covering both restart-related and long-term actions, and which Boston Edison is managing to completion.

(4) Investigations and critiques of specific events at PNPS that have resulted in the development of actions designed to prevent recurrence of such events and to otherwise improve the management of nuclear activities. Examples of these events include the November 1987 loss of power event, the November 1987 work control events, and an ongoing investigation of recent inadvertent Engineered Safeguards Feature (ESF) actuations.

The assessments described above are the "building blocks" which support the RRSA. They are, however, not the only activities that Boston Edison has undertaken to achieve and

maintain excellence at PNPS. This overview does not fully describe the process of introspection, problem identification, and problem solving that is being implemented throughout the Nuclear Organization at PNPS. It is Boston Edison's intention and resolve to continue the self-assessment process at PNPS, to drive this initiative down and across the entire Nuclear Organization, and to make it a part of everyday operations.

C. The Process of Self-Assessment

The RRSA was conducted by Boston Edison Nuclear Organization Management under the auspices of the Management Oversight and Assessment Team (Team). The eight Team members are:

(1) Senior Vice President - Nuclear; Team Chairman

(2) Station Director

(3) Vice President - Nuclear Engineering

(4) Special Projects Director

(5) Quality Assurance Manager

(6) Nuclear Engineering Manager

(7) Assistant to Senior Vice President - Nuclear

(8) Assistant to Senior Vice President - Nuclear

The Team used various sources of information to conduct its review. These sources of information included:

(1) Physical walkdowns accompanied by those responsible for particular systems, components, or areas in order to assess system and area readiness

and to assess the knowledge level and standards of the responsible individuals;

(2) Interviews with those directly responsible for performing work in order to evaluate the extent to which the working level personnel have adopted and are meeting the appropriate standards of performance;

(3) Review and evaluation of reports and documentation concerning programs, plans, and actions necessary for restart and continued operation in order to assess their progress and status;

(4) Interviews with, and presentations by, line management in order to provide a basis for assessing the readiness of line management to support restart and continued operation;

(5) Observations of operating crews on the simulator; and

(6) Review of the observations of independent performance evaluations by the peer evaluation, management monitoring, and QA surveillance programs.

The line management interviews and presentations covered the major Nuclear Organization elements. The managers interviewed, and their respective subject areas included:

Plant Operations Section Manager	-	Operations
Plant Manager	-	Assurance of Quality
Systems Engineering Division Manager	-	Systems Engineering
Assistant to Senior VP - Nuclear	-	Plant Condition Change Checklist #6
Design Section Manager	-	Engineering Evaluations for Restart Testing
Quality Assurance Department Manager	-	Quality Assurance
Regulatory Section Manager	-	Regulatory Compliance
Station Director	-	Site Organization
Radiological Section Manager	-	Radiological Controls
Plant Support Department Manager	-	Plant Support
Security Section Manager	-	Security
Planning and Outage Department Manager (Acting)	-	Planning and Outage Management
Program Manager, Special Projects	-	Peer Evaluation Process
Technical Section Manager	-	Surveillance/Technical
Maintenance Section Manager (Acting)	-	Maintenance
Facilities Division Manager	-	Plant Decontamination
Nuclear Engineering Department Manager	-	Engineering
Emergency Preparedness Department Manager	-	Emergency Preparedness
Fire Protection Division Manager	-	Fire Protection
Nuclear Training Department Manager	-	Training and Qualification Effectiveness

The Team's RRSA review commenced with two weeks of preliminary reviews with line management. This was followed by a month for implementation of ongoing actions which received increased focus and emphasis as a result of the preliminary reviews. The Team then undertook an intensive two-week review during the period April 19 to May 2. The RRSA concluded with approximately three more weeks devoted to consolidating, evaluating, and reporting results, and ensuring that appropriate corrective actions are under way.

The Team's assessment of PNPS readiness for restart was founded on the seven bases described in the Restart Plan. Information used to measure performance against the bases was also obtained from an assessment against the NRC's last SALP Report (86-99), personal observations, interviews by Team members, and assessments of performance on specific restart action items designated in programs such as the Material Condition Improvement Action Plan (MCIAP), the Radiological Action Plan (RAP), and the Restart Regulatory Responses. The Team's review also confirmed the validity of the assessment bases set forth in Chapter V of the Restart Plan. During the course of testing and power ascension, the Team will continue to conduct self-assessments at designated Assessment Points, as described in the Power Ascension Program submitted to the NRC on October 15, 1987.

D. Contents and Organization

The contents of this report are organized along the following lines:

Chapter II - Line Manager Assessments of Readiness for Restart. The discussion presents: (1) matters identified by management relating to plant and equipment performance, operational performance, and management and organization which require specific, well-defined action for restart, and (2) an evaluation of readiness in the context of SALP 86-99 results.

Chapter III - Independent Performance Evaluations in use at PNPS. The discussion presents: (1) a description of three independent performance evaluation processes; (2) a summary of the results of the evaluations; and (3) a summary assessment of those processes.

Chapter IV - Organizational and Personnel Changes. The discussion presents: (1) a description of the long-term organizational structure; (2) a description of the personnel and experience level additions; and (3) the evaluation of organizational structure and personnel changes.

Chapter V - Bases for Self-Assessment of Readiness for Restart. This Chapter contains a summary of the results and conclusions (including identification of any additional necessary actions) of Boston Edison's RRSA, as measured against each of the bases for assessment set forth in Chapter V of the Restart Plan.

Chapter VI - Conclusions. This Chapter summarizes the conclusions of the RRSA.

E. Summary of Results and Conclusions

The major conclusions of the RRSA and, where applicable, the matters identified by the RRSA which require specific, well-defined action before restart, are summarized as follows:

1. Chapter II - Line Manager Assessments of Readiness for Restart

a. Examination of the plant and equipment performance, operational performance, and management and organizational matters by line management identified the following major positive indications and specific actions for restart:

(1) Material Condition and Cleanliness - With regard to cleanliness, responsibility for housekeeping in defined spaces and for the condition of individual plant systems have been assigned. Management participation in inspections with space owners will verify application of proper standards. With regard to material condition, the current process for reporting deficiencies and initiating corrective action is unduly paperwork-intensive. A more efficient method, which uses a single form to initially document deficiencies and a single organizational unit to evaluate and initiate corrective action and follow-up action by cognizant Nuclear Organization elements, is being developed.

Action: The first portion of this process - a single reporting form and a corrective action clearing house - will be initiated prior to restart.

(2) Maintenance - As discussed in Chapter V.C. below, applicable performance indicator trends show that, with continued management attention directed to total Maintenance Requests (MRs), restart MRs, and security-related MRs, Boston Edison has gained control of the maintenance backlog. A comprehensive improvement plan for maintenance has been implemented. The Maintenance Section has been restructured to concentrate its responsibilities upon production work, with increased planning and technical support provided by the Planning and Outage Department and the Systems Engineering Division (SED). In addition, a new position of Deputy to the Maintenance Section Manager was created and filled by an individual with approximately 25 years experience in production and planning for nuclear repair, overhaul, and refueling work.

Action: Priority actions are directed to filling 32 newly authorized, permanent Boston Edison positions within the Maintenance Section that are now staffed on an interim basis by contractors. Strong efforts are being made to complete this staffing before restart. Ten of the positions are designated for supervisors and work planners and these have highest priority. The Station Director and Plant Manager will continue to exercise close oversight of the maintenance function through restart, power ascension, and initial power operation to assure that management control is maintained and improved. In this regard, particular emphasis will be placed upon training and monitoring

of responsible organizational elements to increase their familiarity with and attention to the work control process.

Additional items scheduled before restart include: (a) issuance of an improved/updated Maintenance Control Manual, which will formalize many of the improvements presently in place; (b) revising the troubleshooting procedure to more clearly document work activities during and subsequent to a troubleshooting task; and (c) capturing remaining improvements in appropriate formal PNPS documents.

(3) Planning and Scheduling - Further development of the capability to construct detailed, fully integrated maintenance, surveillance, and testing schedules is planned as part of MCIAP long-term actions. The necessary positions for execution of this plan are included in the permanent organization.

Action: (a) Continue the process for hiring personnel.

(b) Develop an integrated schedule for remaining surveillance and testing to meet restart using an inter-disciplinary team.

(c) Continue addressing remaining maintenance work required for restart in the Plan-of-the-Day and assure that resources are focused on meeting scheduled dates.

(4) Plant Testing and Readiness - As part of the final preparations for restart, reviews of testing for plant equipment and systems are in progress to confirm that safety

systems and selected power generation systems have been adequately tested to assure their readiness for reactor operations and to substantiate the scope of planned power ascension dynamic testing.

Action: Complete reviews, sequence, and schedule any additional testing identified by these reviews for completion prior to restart or during power ascension testing.

(5) System Lineups - Procedures and practices now used to establish and control valve position, including procedures for valve lineup, labelling and systems tagout, are currently under review.

The station tagout procedure, although providing adequate safety protection for equipment and personnel, needs revision. This station procedure authorizes several different tags (red, yellow, Watch Engineer, test). The instructions which govern the use of particular tags need to be revised to eliminate the possibility of any ambiguity or overlap.

The valve lineups for instrumentation in the plant require improvement. The lineup sheets are not instrument- or work-specific, and do not identify all desired valves. The valve name tags for instrument isolation and vent valves do not always contain desired information (e.g. instrument number).

Action: (a) Prior to restart, complete reviews and any necessary changes to provide improved control over valve position and to enable operators to more readily determine valve position status.

(b) Prior to restart, revise the tagout procedure to limit the types and clarify the uses of specific tags.

(c) Prior to restart, develop a plan to implement the INPO good practices for valve lineups and labelling in regard to instrument isolation valves.

(d) Prior to startup develop instrument-specific valve lineup sheets for all safety systems and critical Balance of Plant systems.

(6) Operations Performance - NUREG-1275 highlights the need for actions to minimize performance errors commonly encountered during initial plant operations in general, and following a long outage period in particular. Steps to address fundamental NUREG-1275 issues are an integral part of both the operator training program and the Power Ascension Program. Examples of some additional steps initiated by Boston Edison to address NUREG-1275 concerns are: 1) extensive operator training on the simulator; 2) walkthroughs of certain complicated tests; 3) extensive operator involvement in post-modification tests; and 4) formalized Control Room communications. In addition, several short-term corrective actions have been taken in response to three recent events involving NUREG-1275 issues: the work stoppage in November 1987, the loss of offsite power in November 1987, and recent occurrences of inadvertent ESF actuations. The rate of unplanned ESF actuations is unacceptable

to PNPS management. A multi-disciplinary study of the ESF actuations was recently completed and is under review.

Action: Complete the review of the ESF actuation study and initiate positive actions to reduce the occurrence of unplanned ESF actuations.

(7) Formality of Communications - The accuracy of communications between Control Room operators has been improved as a result of increased formality and specificity. Training is currently in progress in conjunction with annual non-licensed operator requalification training to formalize communications among non-licensed operators and between non-licensed operators and the Control Room personnel. The Training Department has developed lesson plans for formalized communications training of Instrumentation and Control (I&C) technicians and other personnel who may be involved with surveillance and test procedures. This training is being given to technicians in the initial I&C technician training program and will be extended to previously qualified personnel in the future.

Action: No additional actions are required for restart, although Boston Edison will initiate steps to apply appropriate portions of the standards for Control Room communications to I&C and other personnel identified for improvement.

(8) Procedure Adequacy - Boston Edison's top priority in the area of procedures was focused upon the development and validation of Emergency Operating Procedures (EOPs) in

accordance with Rev. 4 of the Boiling Water Reactor (BWR) Owners Group Emergency Procedure Guidelines (EPGs). Development and validation of the EOPs and the associated satellite procedures have been successfully completed. Independent reviews and an inspection by the NRC have confirmed that these efforts have succeeded. Training of operating crews on the simulator using the EOPs has been effective and the independent reviews and the NRC inspection have similarly confirmed the success of these efforts.

Action:

(a) Validate procedures revised during RFO-7 which are necessary for power operations.

(b) As described in Chapter III of the Restart Plan, Boston Edison plans to implement a long-term program for upgrading the human factors elements of PNPS procedures.

(9) Drawing Completeness and Accuracy - During the initial stages of the self-assessment, Boston Edison identified a need to evaluate the completeness and accuracy of Priority A Control Room drawings. A surveillance by the Quality Assurance Department (QAD) was promptly initiated. Even though Boston Edison's historically effective modification management program and electrical and mechanical drawing update walkdowns afforded reason for confidence, the surveillance was initiated to independently evaluate the plant drawing update process. The surveillance has been completed and two deficiency reports were

issued. Preliminary investigation by line management indicates the deficiencies in Priority A drawings are minor in scope, not safety significant, and can be readily addressed before restart.

Action: Resolve deficiency reports prior to restart.

(10) Institutionalization of Site Work Practices - A number of practices have been implemented and/or improved as a result of Boston Edison's emphasis on meeting rising standards of excellence. While the practices are positive signs, many have not been formally proceduralized. Attention is now being directed to formally institutionalizing those practices so that they become permanent, controlled elements of Boston Edison's work.

Action: Prior to restart, begin actions to institutionalize practices involving:

(a) planning, scheduling, assignment, pre-job briefing, and control of maintenance; and

(b) the event investigation and critique process, including the process for determination of underlying causes, and assigning and accomplishing identified actions.

After power ascension, efforts will be directed to institutionalizing the peer evaluator process, and developing a long-term, issue-oriented data base.

(11) Long-Term Improvement - Boston Edison management attention will remain focused on long-term activities

designed to build upon the improvements made during RFO-7 which are addressed in this report. Boston Edison will continue to monitor its performance against rising standards of excellence, fashion appropriate critical self-analyses, and implement actions aimed at achieving continued improvement. Resources will be aligned to support these actions based upon a long-term plan and budget.

b. Examination of the current state of readiness in light of the major SALP 86-99 issues indicates:

(1) An improved performance trend in all areas which were rated a "3" in SALP 86-99 (radiological controls, surveillance, fire protection, security, and assurance of quality).

(2) All SALP functional areas have been evaluated and, subject to closure of the identified actions remaining, Boston Edison will have resolved the issues identified in the SALP that are necessary for restart.

2. Chapter III - Independent Performance Evaluations

The peer evaluation process has provided a mechanism for helping to assess the readiness of PNPS and PNPS personnel for initial criticality and power ascension, identifying specific issues which require management attention.

The Team has concluded that the peer evaluation process and the QA surveillance monitoring program are valuable tools

that facilitate the assessment process and are useful adjuncts to existing line management monitoring processes.

3. Chapter IV - Organizational and Personnel Changes

Boston Edison has taken substantial action to restructure its organization and augment the experience and expertise of its key management personnel. The major points that emerge from Boston Edison's evaluation of organizational and personnel changes are:

(a) The plan for transition to a long-term organization has been developed and essential elements of the long-term organization have been implemented.

(b) Substantial management experience and expertise have been added to the organization in key positions. A strong, effective management team is in place; although full Boston Edison manning of the expanded Maintenance Section is still required.

(c) Particular attention is being directed toward assuring that recent actions to reorganize, augment, and upgrade the maintenance organization are effectively implemented.

(d) Important items which will receive continued attention are: (1) making permanent appointments (through hiring or promotion) to the positions of Planning and Outage Department Manager and Maintenance Section Manager; and (2) defining and authorizing the full personnel complement of the Nuclear Organization. A plan to fill the function of Radiation

Protection Manager with a Boston Edison employee meeting the qualifications of Regulatory Guide 1.8 will be developed and implemented.

4. Chapter V - Bases for Self-Assessment of Readiness for Restart

The process and results of the RRSA have confirmed the appropriateness and viability of the Restart Plan. In its letter to Boston Edison, dated May 6, 1988, the NRC acknowledged the viability of the Restart Plan, and accepted it as a suitable framework for responding to the NRC's request for a self-evaluation of restart readiness. Only limited changes to the Restart Plan description are necessary to reflect current implementation at PNPS. These changes are reflected in Chapter IV below, (changes to organizational structure and personnel), and in Chapter V.A.1., V.B.1., and V.D.2. below, (changes to Restart Plan Chapters II, III and IV). Changes to the Restart Plan, Vol. 2, Appendix 10 are identified in Appendix 11 of Vol. 2, Rev. 2.

The RRSA has also confirmed the appropriateness and validity of the seven bases for the self-assessment of readiness for restart that were established in Chapter V of the Restart Plan. Boston Edison's progress in meeting each of these bases was evaluated during the RRSA. The results of Boston Edison's assessment of its restart readiness, as measured against each of the bases set forth in the Restart Plan, are summarized below:

(1) "Management will have executed its plans for RFO-7 work."

CONCLUSION: Major modification work scheduled for the outage is complete. As discussed in Chapter IV of this report, the plan for transition to the long-term organization has been developed and essential elements of the long-term organization are in place. Positive signs that a real commitment to excellence has penetrated the organization include: operator performance in responding to off-normal events on the training simulator; improved operator decorum and formality in the Control Room; and the increasingly effective interface between the Systems Engineering Division (SED), Operations, and Maintenance, between Radiological and Maintenance, and between QA and Operations, Maintenance and Support functions. While the current planning and work control system is adequate to support restart, continued management attention will be required to improve its implementation and efficiency. Some emergent modification work is being planned and scheduled for completion before restart. Sequenced work and testing will be completed prior to restart or during power ascension, as applicable. The ongoing review of power and pre-power ascension testing will be completed and any additional testing will be scheduled prior to restart as the need is identified.

(2) **"Staffing levels will be adequate to support safe and reliable restart and continued operation, and a plan for orderly transition from the restart organization to a long term organization will be established."**

CONCLUSION: The major actions to support restart have been implemented. The organizational structure has been realigned to be more responsive to plant needs. Experienced key managers are in place. Actions such as the in-house orientation training program for new hires and expansion of the SED role to provide an interface with the Maintenance Planning Division are positive indicators. A high level of management attention and emphasis will continue in order to attain and/or maintain staffing objectives in the planning, maintenance, and radiological areas. Licensed operator resources will be sufficient to meet established goals. Boston Edison's implementation of essential elements of the long-term organization reinforces its commitment to achieve and maintain an excellent organization over the long term. The Nuclear Mission Statement issued in the 1987 Mission, Organization and Policy Manual (MOP) was revised in April 1988, to include emphasis on the nuclear ethic. The number of contractor personnel at PNPS has been substantially reduced and the objective of minimizing reliance on contractor resources has been met. Experience in 1988 concerning overtime shows a positive trend and current good management control.

(3) "Positive trends in pertinent performance indicators for RFO-7 work, including backlog work, will show that management control has been established."

CONCLUSION: The performance indicators show a positive trend. Total MRs, restart MRs, and security-related MRs still need full attention and will be further driven down by aggressive management action. A favorable trend is indicated by the fact that work to reduce Deficiency Reports (DRs) and Non-Conformance Reports (NCRs) was largely accomplished by Boston Edison personnel while contractor personnel were being phased out.

(4) "Self-assessments will have been performed and action plans established, including comprehensive action plans addressing material condition (including maintenance) and radiological controls, to assure that management control will continue."

CONCLUSION: The Restart Plan, Vol. 2, Rev. 2 has been submitted with this report. Closure of 410 of 498 restart commitments is complete and the remaining items are scheduled for closure prior to restart or during testing and power ascension. The programs, plans, and actions described in the Restart Plan, Chapters II, III, and IV, have been substantially implemented, with exceptions as noted in this report. A MCIAP has been developed and is being implemented in accordance with its provisions. A RAP has been developed and implemented in accordance with its provisions.

(5) **"Regulatory issues will have been addressed."**

CONCLUSION: Confirmatory Action Letter (CAL) 86-10 restart items, Management Meeting 86-41 restart items, and Boston Edison Restart Regulatory Responses have been internally closed or sequenced for completion. Restart regulatory commitment changes have been reviewed, revised as appropriate, and are being reported to the NRC in the Restart Plan, Vol. 2, Rev. 2.

(6) **"Systems group reviews will have been completed and restart actions identified in those reviews will have been closed or specifically scheduled in the approach to startup."**

CONCLUSION: Summary reports on the results of the SED (formerly Systems Group) reviews for each system reviewed will be provided in Appendix 12 to the Restart Plan, Vol. 2, Rev. 2. Restart actions are either closed or scheduled in the approach to start-up.

(7) **"The RFO-7 Power Ascension Program, including NRC hold points, will have been established."**

CONCLUSION: Boston Edison's letter 87-163, dated October 15, 1987, submitted the Power Ascension Program to the NRC. By letter 88-033, dated February 29, 1988, Boston Edison responded to NRC questions on the program. As indicated under basis (1) above, the ongoing review of power and pre-power ascension testing will be completed and additional testing (if required) will be scheduled for completion prior to restart or during power ascension.

5. Chapter VI - Conclusions

The RRSA has confirmed the appropriateness and validity of Boston Edison's Restart Plan which was submitted by Boston Edison on July 30, 1987. The NRC acknowledged the viability of the Restart Plan, and accepted it as a suitable framework for responding to the NRC's request for a self-evaluation of restart readiness.

The RRSA has identified the following matters relating to plant and equipment performance, operations performance, and management and organization which show significant improvement but which require completion of specific, well-defined actions for restart: material condition and cleanliness; maintenance; planning and scheduling; plant testing and readiness; system lineups; operations performance; formality of communications; procedure adequacy; drawing completeness and accuracy; and institutionalization of site work practices. Schedules for actions to address these matters will be provided to the NRC by separate correspondence requesting commencement of the NRC's team inspection.

The RRSA found an improved performance trend in the functional areas of radiological controls, surveillance, fire protection, security, and assurance of quality, all of which were identified as areas for increased attention by the NRC's SALP 86-99 report. Subject to closure of remaining actions identified by PNPS line management, Boston Edison will have resolved the issues identified in the SALP 86-99 report.

The results of Boston Edison's independent performance evaluations indicate that the peer evaluation process and the QA surveillance monitoring program are valuable tools that facilitate the assessment process and are useful adjuncts to existing line management monitoring processes.

The plan for transition to a long-term organization has been developed and essential elements of the long-term organization have been implemented. Substantial nuclear management experience and expertise have been added to the organization in key positions; although full Boston Edison manning of the expanded Maintenance Section is still required.

The RRSA confirmed the appropriateness and validity of the bases for self-assessment of readiness that were established in Chapter V of the Restart Plan. Those bases for assessment of readiness for restart have been substantially met.

Boston Edison has concluded that, upon completion of the actions identified in the RRSA and the Restart Plan, PNPS will be ready for safe and reliable restart and continued operation.

II. LINE MANAGER ASSESSMENTS OF READINESS FOR RESTART

This Chapter summarizes the results of Boston Edison line manager assessments of readiness for restart. The discussion is organized to address: 1) the matters identified by line management relating to plant and equipment performance, operational performance, and management and organization that require specific action before restart; and 2) the assessments of readiness versus SALP evaluation factors and the major NRC observations identified in SALP 86-99.

A. Matters Relating to Plant and Equipment Performance, Operational Performance, and Management and Organization That Require Specific Action Before Restart

Based upon review of assessments by line management, input from independent reviewers of operational readiness, and personal observations of Team members, the RRSA has identified a set of: 1) positive indications; and 2) matters that require specific action before restart in each of the three principal groups of issues addressed in the Restart Plan; namely, a) plant and equipment performance matters (Chapter IV of Restart Plan); b) operational performance matters (Chapter III of Restart Plan); and c) management and organizational matters (Chapter II of Restart Plan). A summary description of positive indications and issues requiring specific action is presented below, organized according to principal issue group. This discussion is intended to focus only upon the relatively discrete set of issues that

management considers most important and worthy of greatest attention at this time. In so limiting this discussion, Boston Edison does not intend to exclude from consideration any of the issues discussed elsewhere in this report and/or identified during the course of the self-assessments and execution of the Restart Plan. These additional issues will be managed within Boston Edison's corrective action, restart action, and long-term action systems, as applicable.

1. Plant and Equipment Performance Matters

The positive indications and areas requiring specific action are summarized below with respect to: (a) material condition and cleanliness; (b) maintenance; (c) planning and scheduling; and (d) plant testing and readiness.

a. Material Condition and Cleanliness

With regard to cleanliness, responsibility for housekeeping in defined spaces and for the condition of individual plant systems have been assigned. Existing assignments will be expanded to cover essential equipment and conditions for spaces such as the drywell and reactor building quadrants. The Station Director and Plant Manager will verify, by inspections with the space owners, that the space owners are applying the proper standards and that they are accountable to achieve conditions acceptable for restart for assigned equipment or spaces.

With regard to material condition, the current process for reporting deficiencies and initiating corrective action is unduly paperwork-intensive. Changes are needed to improve productivity and to enhance the timeliness of corrective actions. A more efficient method is being developed which uses a single form to initially document discrepancies and a single organizational unit to evaluate and initiate corrective action and follow-up by cognizant Nuclear Organization elements.

Action: The first portion of this process -- a single reporting form and a corrective action clearing house -- will be initiated prior to restart. In the longer term, this activity will be expanded and integrated with PNPS information systems with the objectives of: a) reducing the number of redundant corrective action tracking systems; and b) providing more readily accessible and usable management information tools.

b. Maintenance

As discussed in Chapter V.C. below, applicable performance indicator trends show that, with continued management attention directed to total MRs, restart MRs, and security-related MRs, Boston Edison has gained control of the maintenance backlog. Further, self-assessments have resulted in implementation of a comprehensive improvement action plan for maintenance -- the MCIAP. Assignment of two Nuclear Watch Engineers (NWEs), on a rotating basis, to assist both the Planning and Outage Department and the Maintenance Section in planning and

coordinating work has improved responsiveness to Operations. Assignment of a radiological control specialist to the maintenance production organization has promoted the building of radiological controls directly into the work process. Decontamination efforts have resulted in improved access for, and the efficiency of, maintenance. The Maintenance Section is being restructured to concentrate its responsibilities upon production work, with increased planning and technical support provided by the Planning and Outage Department and the SED. In addition, a new position of Deputy to the Maintenance Section Manager was created and filled by an individual with approximately 25 years of experience in production and planning for nuclear repair, overhaul, and refueling work.

Considerable attention will be required to strengthen and improve this element of the organization. Improved communications between the Maintenance Section and interfacing elements of the Nuclear Organization, and increased staffing within the Maintenance Section will have a positive influence on improvement.

Action: Priority actions are being directed to filling 32 newly authorized, permanent Boston Edison positions within the Maintenance Section that are now staffed on an interim basis by contractors. Ten of the positions are designated for supervisors and work planners. Management has given advance approval and the highest priority for hiring in order to more effectively support team building within the Maintenance Section.

Additional items scheduled before restart include: (a) issuance of an improved/updated Maintenance Control Manual, which will formalize many of the improvements presently in place, (b) revising the troubleshooting procedure to more clearly document work activities during and subsequent to a troubleshooting task; and (c) capturing remaining improvements in appropriate formal PNPS documents.

The Station Director and Plant Manager will continue to exercise close oversight of the maintenance function through restart, power ascension, and initial power operation to assure that management control is effectively maintained and improved. In this regard, particular emphasis will be placed upon training and monitoring of responsible organizational elements to increase their familiarity with and attention to the work control process.

c. Planning and Scheduling

Further development of the capability to construct detailed, fully integrated maintenance, surveillance, and testing schedules is planned as a part of MCIAP long-term actions. The necessary positions for execution of this plan are included in the permanent organization.

Action: a. Continue the process for hiring personnel.

b. Develop an integrated schedule for remaining surveillance and testing to meet restart using an inter-disciplinary team.

c. Continue addressing remaining maintenance work required for restart in the Plan-of-the-Day and assure that resources are focused on meeting scheduled dates.

d. Plant Testing and Readiness

Reviews of testing for plant equipment and systems are in progress to confirm that safety systems and selected power generation systems have been adequately tested to assure their readiness for reactor operations and to substantiate the scope of planned power ascension dynamic testing. The scope of review includes Logic System Functional Testing (LSFT) and post-work testing (PWT), and the results of the review will be documented and retained at PNPS. The scope of testing prior to start-up is being reviewed to confirm that such tests will adequately test the effects of plant modifications and major maintenance on selected power generation and safety systems.

Action: Complete reviews, sequence, and schedule any additional testing identified by these reviews for completion prior to restart or during power ascension testing.

2. Operational Performance Matters

The positive indications and areas requiring specific action are summarized below with respect to: 1) system lineups; 2) operational performance; 3) formality of communications; 4) procedure adequacy; and 5) drawing completeness and adequacy.

a. System Lineups

Procedures and practices now used to establish and control valve position, including procedures for valve line-up, labelling and systems tagout, are currently under review.

The station tagout procedure, although providing adequate safety protection for equipment and personnel, requires revision. This station procedure authorizes several different tags (red, yellow, Watch Engineer, test). The instructions which govern the use of particular tags need to be revised to eliminate the possibility of any ambiguity or overlap.

The valve lineups for instrumentation in the plant require improvement. The lineup sheets are not instrument- or work-specific, and do not identify all desired valves. The valve name tags for instrument isolation and vent valves do not always contain desired information (e.g. instrument number).

Action: (a) Prior to restart, complete reviews and any necessary changes to provide improved control over valve position and to enable operators to more readily determine valve position status.

(b) Prior to restart, revise the tagout procedure to limit the types and clarify the uses of specific tags.

(c) Prior to restart, develop a plan to implement the INPO good practices for valve lineups and labelling in regard to instrument isolation valves.

(d) Prior to startup, develop instrument-specific valve lineup sheets for all safety system and critical Balance of Plant systems.

b. Operations Performance

NUREG-1275 highlights the need for actions to minimize performance errors commonly encountered during initial plant operations in general, and following a long outage period in particular. Steps to address fundamental NUREG-1275 issues are an integral part of both the operator training program and the Power Ascension Program. Examples of some additional steps initiated by Boston Edison to address NUREG-1275 start-up concerns are: 1) extensive operator training on the simulator; 2) walk-throughs of certain complicated tests; 3) extensive operator involvement in post-modification tests; and 4) formalized Control Room communications. An extensive review of the Power Ascension Test Program is in progress.

In addition, several short-term corrective actions have been taken in response to three recent events involving NUREG-1275 issues: the work stoppage in November 1987, the loss of offsite power in November 1987 and recent occurrences of inadvertent ESF actuations. The rate of unplanned ESF actuations is unacceptable to PNPS management. A multi-disciplinary study of the ESF actuations was recently completed and is under review by Station Management.

Boston Edison sees a real need for close oversight, through peer evaluation, an additional (third) Senior Reactor Operator (SRO) on shift, and frequent management presence, so that operations are especially controlled, deliberate, and conservative as operating experience is assimilated by the Nuclear Organization. These oversight elements are an integral part of the Power Ascension Program.

Action: Complete the review of the ESF actuation study and initiate positive actions to reduce the occurrence of unplanned ESF actuations.

c. Formality of Communications

The accuracy of communications between Control Room operators has been improved as a result of increased formality and specificity. Training is currently in progress in conjunction with annual non-licensed operator requalification training to formalize communications among non-licensed operators and between non-licensed operators and the Control Room personnel. The Training Department has developed lesson plans for formalized communications training of I&C technicians and other personnel who may be involved with surveillance and test procedures. This training is being given to technicians in the initial I&C technician training program and will be extended to previously qualified personnel in the future. A Station Instruction has established standards for Control Room communications. Present communications practices meet, and in the case of Control Room Operators, exceed current industry practices and are adequate for

restart. However, Boston Edison intends to continue upgrades throughout the organization for the foreseeable future.

Action: No additional actions are required for restart, although Boston Edison will initiate steps to apply appropriate portions of the standards for Control Room communications to I&C and other personnel identified for improvement.

d. Procedure Adequacy

Boston Edison's top priority in the area of procedures was focused upon development and validation of Emergency Operating Procedures (EOPs) in accordance with Revision 4 of the Boiling Water Reactor (BWR) Owners Group Emergency Procedure Guidelines (EPGs). Development and validation of the EOPs and the associated satellite procedures have been successfully completed. Independent reviews and an inspection by the NRC have confirmed that these efforts have succeeded. Training of operating crews on the simulator using the EOPs has been effective, and independent reviews and an NRC inspection have similarly confirmed the success of these efforts.

Procedures affected by modifications have been or are being revised in accordance with the Boston Edison modification management process. Training on those revisions for the operators and validation will be completed before restart. The procedure validation process normally includes a desk top review and/or walkdown to ensure the procedure can be performed as written. In some cases the simulator is used in the process.

Validation of surveillance procedures is in progress with 306 (63%) remaining. Overall, the validation process (excluding EOPs and their satellite procedures which are complete) is well under way with 961 (62.3%) remaining to be validated. The plan calls for the validation of procedures required for restart and power operation to be completed before restart. Procedures can be deferred with Department Head approval if they do not fall into either of these categories. An example of the type of procedures that does not fall into these categories would be those used for fuel handling which would be used during the next refueling outage. The Procedure Supervisor maintains a data base and publishes indicators at least weekly to ensure that each procedure owner and respective Department Head are aware of the progress and can manage validation to conclusion.

As described in Chapter III of the Restart Plan, Boston Edison has conducted a review of procedures required for restart emphasizing those affected by Plant Design Changes (PDCs) completed during RFO-7. In addition, specific procedure deficiencies have been corrected as identified. Some human factors items have been incorporated as procedures were revised. A long-term plan for upgrading PNPS procedures to reflect human factors elements has been established. A Procedures group has been added to the Station Organization. An experienced Procedures Supervisor has been hired and additional staff are presently being interviewed and will be hired during the summer.

A writers' guide to direct the efforts of the Procedures group is in progress.

Action: Validate procedures revised during RFO-7. Prior to restart, complete training on procedures revised for modifications and implement the writers guide. An upgrade of Operations procedures by the Procedures group is scheduled as a long-term effort.

e. Drawing Completeness and Accuracy

During the initial stages of the self-assessment, Boston Edison identified a need to evaluate the completeness and accuracy of Priority A Control Room drawings. A surveillance by the Quality Assurance Department (QAD) was promptly initiated. Even though Boston Edison's historically effective modification management program and electrical and mechanical drawing update walkdowns afforded reason for confidence, the surveillance was initiated to independently evaluate the plant drawing update process. The surveillance has been completed and two deficiency reports were issued. Preliminary investigation by line management indicates the deficiencies in Priority A drawings are minor in scope, not safety significant, and can be readily addressed before restart.

Action: Resolve deficiency reports prior to restart.

3. Management and Organization

Two major matters concerning management and organization warrant particular attention. First, a number of practices have been implemented and/or improved as a result of Boston Edison's emphasis on meeting rising standards of excellence. While the practices are positive signs, many have not been formally proceduralized. Attention is now being directed to formally institutionalizing those practices so that they become permanent, controlled elements of Boston Edison's work.

The second major area of attention involves long-term activities designed to build upon the improvements made during RFO-7 which are addressed in this report. Boston Edison will continue to monitor its performance against rising standards of excellence, fashion appropriate critical self-analyses, and implement actions aimed at gaining continued improvement. Resources will be aligned to support these actions based upon a long-term plan and budget.

Action: Prior to restart begin actions to institutionalize practices involving:

(a) planning, scheduling, assignment, pre-job briefing, and control of maintenance; and

(b) the event investigation and critique process, including the process for determination of underlying causes, and assigning and accomplishing identified actions.

After power ascension, efforts will be directed to institutionalizing the peer evaluator process, and developing a long-term, issue-oriented data base.

B. Assessment Based Upon SALP Evaluation Factors

To provide an additional basis upon which to measure Boston Edison's readiness to restart PNPS, the RRSA included an assessment of readiness for restart based upon the NRC's SALP evaluation factors. Based upon line manager inputs, Boston Edison has measured its state of readiness against the major observations in NRC's SALP Report 86-99 in each of 12 functional areas identified in the Report.

Consistent with the NRC's SALP methodology, the 12 functional areas examined were:

(1) Plant Operations

(2) Radiological Controls

(3) Maintenance

(4) Surveillance

(5) Fire Protection

(6) Emergency Preparedness

(7) Security and Safeguards

(8) Outage Management, Modifications and Technical Support Activities

(9) Licensing Activities

(10) Engineering and Corporate Technical Support

(11) Training and Qualification Effectiveness

(12) Assurance of Quality

One or more of the following evaluation criteria were used in Boston Edison's assessment of each functional area:

(1) Management involvement and control in assuring quality;

(2) Approach to the resolution of technical issues from a safety standpoint;

(3) Responsiveness to NRC initiatives;

(4) Enforcement history;

(5) Operational and construction events (including response to, analyses of, and corrective actions for);

(6) Staffing (including management);

(7) Training and qualification effectiveness;

The discussion that follows addresses each of the 12 functional areas in sequence. Within each functional area, the major NRC SALP 86-99 observations are identified, followed by a summary description of the actions which have been taken and remain to be taken in response to each observation. Finally, Boston Edison's evaluation of the current state of readiness in light of major SALP 86-99 issues is summarized.

1. Plant Operations

a. NRC Observation: Attention to detail - Technical Group post-trip reviews. (SALP 86-99, page 11.)

PNPS Action: Shift Technical Advisors (STAs) were instructed on the proper methods and procedures for conducting post-trip reviews. The STA training and requalification programs have been improved to stress the importance of thorough

and accurate post-trip reviews and to minimize the potential for poorly and improperly conducted post-trip reviews. Specified types of trips receive a second review by a team in accordance with a post-trip review procedure. The review team is customarily chaired by the Chief Operating Engineer (COE). Representatives of the SED and the Maintenance Section also participate. Additional expertise from other disciplines may also be included, if required. This multi-disciplinary, multi-layered approach provides a mechanism for bringing greater attention to detail to post trip reviews.

Actions Remaining: Continue actions as described above.

b. NRC Observation: Attention to detail - Control Room log keeping practices. (SALP 86-99, page 11.)

PNPS Action: To improve Control Room log-keeping practices, the Conduct of Operations Procedure has been upgraded to require more professional and complete log-keeping practices, including standards for making entries into the log. Night Orders frequently remind personnel of the importance of good log-keeping. Frequent informal audits are performed to assess compliance with the revised Conduct of Operations Procedure. As a result of these practices, the Reactor Operators (ROs) log shows significant improvements; and the Nuclear Operations Supervisors (NOSs) log has shown satisfactory improvement, as has the Nuclear Auxiliary Operators (NAOs) radwaste log. The formal NWEs log has been eliminated as redundant. Monitoring

of the RO, NOS, and NAO logs will be continued and any further corrective action necessary to maintain high-quality and accurate logs will be undertaken.

Actions Remaining: Continue actions as described above.

c. NRC Observation: Attention to detail - status of inoperable, nonsafety-related equipment, and working relationship between Operations and Maintenance personnel. (SALP 86-99, page 11.)

PNPS Actions: The interface between the Operations Section and the Maintenance Section has been improved by the assignment of two NWEs, on a rotating basis, to assist both the Planning and Outage Department and the Maintenance Section in planning and coordinating work. Routine work prioritization now is performed at the working level in Operations. Further, the "System Window" concept of work performance recently initiated allows lower priority MRs to be worked on all systems. Under the "System Window" concept, the PNPS plant systems and areas are categorized into four different "windows." Maintenance work is scheduled for one window per week to optimize the application of Maintenance resources to outstanding work. The "System Window" concept is used for most maintenance work including modifications and preventive and corrective maintenance.

A new Limiting Condition for Operation (LCO) procedure has been developed for tracking of compliance with the Technical Specifications. After the training cycle has been completed, it will be fully implemented. An improved Plant Status Board procedure is being finalized. A lifted lead and jumper log procedure has also been developed and is awaiting implementation pending training. This log will facilitate management and control of lifted lead and jumper modifications to the plant.

Actions Remaining: Continue actions as described above.

d. NRC Observation: Relations between the Operations and Radiological Controls organizations - control of access through the high radiation door. (SALP 86-99, page 11.)

PNPS Action: High radiation access key control responsibility is assigned to Health Physics (HP). A two-person rule has been instituted, which applies whenever the locked high radiation areas are accessed. HP backs up these controls with its own program to verify door closure. Since implementation of these practices in January 1988, there have been no high radiation area door locking violations.

Actions Remaining: Continue actions as described above.

e. NRC Observation: Relations between Operations and Radiological Controls - amount of attention given to the implications of major systems isolation. (SALP 86-99, page 11.)

PNPS Action: Meetings are conducted on shift which include HP and Radiochemistry personnel. Plant condition, systems status, and planned evolutions which could affect radiological or chemistry conditions are addressed during the shift turnover. This practice is effective in identifying problems or concerns for resolution before evolutions are commenced.

Actions Remaining: Operations, Radiological Section management, and the Independent Radiological Oversight Committee (IROC) will continue to monitor the relationship between the Operations and Radiological Section and will prescribe corrective action as required. Routine spill drills have been initiated to exercise interdisciplinary skills and formalized communications training is being developed for HP technicians. This training will facilitate communications between Operations and the Radiological Section during the high stress conditions that would exist in the event of a radiological incident.

f. NRC Observation: Relations between the Operations and Radiological Controls - preplanning by the Operations and Outage Support Staff. (SALP 86-99, page 11.)

PNPS Action: It had been customary to provide pre-shift and pre-evolution briefings to workers. The content of the pre-evolution briefings has been enhanced. Additionally, this practice has now been formally implemented through an operating procedure. This will strengthen the pre-

evolution briefings in process. Two NWEs have been assigned on a rotating basis to assist both the Planning and Outage Department and the Maintenance Section to improve coordination of the work, to represent Operations' concerns to the Planning and Outage Department and Maintenance Section staffs, to correctly prioritize the work to be done, and to facilitate detailed planning. There will be continued support to the planning effort with the NWEs rotated off the watch. The two NWEs will be rotated on a periodic basis. As additional SROs complete training in 1989, the rotational program will be expanded to include not only Maintenance and Training, but also Emergency Preparedness and other functional areas which require close cooperation with Operations. Also, continued efforts will be made to improve the "work control" program, as discussed in Chapter II.B.3. below. As discussed in this report (for example, Chapter II.B.7. below), these improvements will have a salutary effect throughout the PNPS organization.

Actions Remaining: Continue actions as described above.

g. NRC Observation: Numbers of Operations personnel and the level of operating experience among the licensed operators. (SALP 86-99, page 11.)

PNPS Action: Two licensed operator classes, with eight operators in each class, have been concluded, each with a 100 percent pass rate. There has been reduced attrition as a result of improvements in the prestige and professional status of the operators. Reduced overtime has also reduced the

attrition rate. No resignations have occurred since November 1987. Presently, 14 SROs and 22 ROs maintain active licenses. Only eight ROs, however, have unrestricted licenses. Restrictions on the other 14 ROs will be lifted after these individuals complete 20 days (eight-hour working shifts) of experience above 20 percent power and after completion of required reactivity manipulations. These evolutions are scheduled for completion during the Power Ascension Program.

Boston Edison has taken many steps to strengthen the degree of operating experience among the licensed operators. The number of licensed operators has been increased and maximum use has been made of the simulator to provide experience. During the testing and power ascension program, hold points will be of sufficient duration to allow operators to gain experience at the various power levels. The situation at present is stable and the experience of the licensed operators will be further enhanced once PNPS is at power. When all operators are fully licensed and qualified, a regular rotation program will be instituted to provide additional experience for senior operators. This will occur after completion of power ascension testing.

Actions Remaining: Continue actions as described above. Complete actions to remove restrictions on licenses during the Power Ascension Program.

h. NRC Observation: Use of overtime and the use of senior licensed staff to staff the watch. (SALP 86-99, page 11.)

PNPS Action: Overtime has now been reduced by providing adequate numbers of licensed operators and overtime is being effectively controlled. Senior licensed staff were removed from the watchbill when the newly licensed Reactor Operators (ROs) became available for the shutdown watch. Senior licensed staff are no longer on the watchbill except for license maintenance purposes. There will be continued close monitoring of overtime to ensure compliance with NRC guidelines, especially during power ascension when, of necessity, a significant but temporary increase in overtime can be expected.

Actions Remaining: Continue actions as described above.

i. NRC Observation: Professional support staff for Operations. (SALP 86-99, page 11.)

PNPS Action: Boston Edison has reorganized the Operations Section to provide increased professional support for the line function. The reorganization was made in recognition of the administrative burden and broad span of control placed on the COE. The reorganization has reduced the COE's responsibilities for administrative and managerial tasks not directly related to plant operation, while forming the nucleus of a professional support group to support line management within the Operations Section. This group is currently staffed by two staff engineers, six qualified STA's (transferred to Operations from the Technical Section) and the

on-shift Administrative Assistants. Additional professional support staff for Operations is under evaluation by management.

Actions Remaining: Continue actions as described above.

j. NRC Observation: System Operating Alarm Response Procedures (ARPs) and the Emergency Operating Procedures. (SALP 86-99, page 11.)

PNPS Action: Boston Edison has upgraded the EOPs in accordance with the Rev. 4 EPGs. EOP training for current on-shift operating crews is scheduled for completion shortly. The ARPs have been rewritten and revised. Validation of the System Operating ARPs is now 70 percent complete with completion scheduled before restart. A human factors upgrade of the operating procedures is being planned. A writers' guide, with industry standard human factors guidance, is planned to be published on or before June 30, 1988. Technical support for this project will come from Boston Edison operations personnel and a minimal number of contractor personnel with recent experience regarding operating procedures. The project will be managed by the Procedures group. The upgrade is currently scheduled as a long-term effort.

Actions Remaining: Continue actions as described above.

k. NRC Observation: Operations' response to QA findings. (SALP 86-99, page 12.)

PNPS Action: Effective corrective action has been taken. As of May 11, 1988, there were no overdue QA

continuing actions are under way to improve awareness of radiological protection in everyday work practices throughout PNPS. These long-term RAP actions will serve to ensure sustained long-term improvement in the radiological area.

Actions Remaining: Continue actions as described above.

b. NRC Observation: Procedures to satisfy Radiological Improvement Program (RIP) commitments. (SALP 86-99, page 15.)

PNPS Action: A program to upgrade and validate procedures to reflect RIP commitments was conducted. In addition, personnel training, which has emphasized both the need for compliance with radiological procedures and each worker's accountability for using good radiological practices in his work, has enhanced the effectiveness of the improved procedures.

Actions Remaining: Continue actions as described above.

c. NRC Observation: Prompt, comprehensive corrective actions. (SALP 86-99, page 15.)

PNPS Action: Long-term actions to improve responsiveness to identified radiological problems are a major portion of the RAP. Through the radiological critique process for radiological incidents and the increasingly stringent standards which Boston Edison has applied to the issuance of RORs, radiological corrective actions are now more prompt and comprehensive. During the past two months, outstanding Radiological Occurrence Reports (RORs) have remained below 15,

Deficiency Reports (QADRs) outstanding in Operations. A professional relationship with the QAD has been achieved. Efforts are being undertaken to assure that this professionalism continues. Moreover, Operations is undertaking prompt and objective investigation of oversight group concerns, findings, and/or recommendations, as well as taking effective corrective and/or improvement action where warranted. Weekly meetings with the QAD and PNPS management to discuss the interface between Operations and the QAD have been initiated. The purpose of the meetings is to promote effective communication, to facilitate prompt and effective corrective action, and to discuss any negative trends or concerns that require resolution. The Operations Section Manager has taken a personal role in addressing QA concerns, findings, and recommendations. A similar personal role has been taken by other PNPS managers.

Actions Remaining: Continue actions as described above.

2. Radiological

a. NRC Observation: Implementation and effectiveness of Radiological Improvement Program (RIP). (SALP 86-99, page 14.)

PNPS Action: Significant progress has been made. The implementation and effectiveness of the Radiological Improvement Plan (RIP) actions have been closely monitored by PNPS management. The NRC's closeout of its Radiological Order Modifying License, in 1988, is evidence of the effectiveness of actions taken. Under the Radiological Action Plan (RAP),

with most addressed in under one week. However, continued attention to Radwaste resin transfers is necessary to ensure that the RAP actions are equally effective in that area.

Actions Remaining: Continue actions as described above.

d. NRC Observation: Vacancies. (SALP 86-99, page 15.)

PNPS Action: The Radiological Section has taken effective action to fill vacancies. As a result, less than 10 percent of the identified positions are now open. Long-term actions to address this issue are included in the RAP. In addition, the Radiological Section is working to train the new hires quickly. An HP Supervisor training program is being developed for implementation in the near term. Efforts continue to identify a permanent Boston Edison Radiation Protection Manager.

Actions Remaining: Continue actions as described above.

e. NRC Observation: Communications between groups. (SALP 86-99, page 14.)

PNPS Action: Communications between the Radiological Section personnel and other PNPS organizations have been significantly improved. As described in Chapter II.B.1.d., e., and f. above, the working relationship between the Radiological and Operations Sections has been improved as a result of a number of initiatives such as the critique process

and the pre-shift briefings. In addition, communications is a fundamental ongoing element of the RAP.

Actions Remaining: Continue actions as described above.

f. NRC Observation: Accountability. (SALP 86-99, page 14.)

PNPS Action: Accountability has been improved. Through actions described in the RAP, there is an increased emphasis on personal responsibility and accountability for deficient conditions or actions. Steps taken to improve communications between groups have also contributed to the improved awareness of radiological issue "ownership." Continued attention to disciplinary measures is being followed as a RAP item in the long term.

Actions Remaining: Continue actions as described above.

g. NRC Observation: Aggressive Goals Program. (SALP 86-99, page 16.)

PNPS Action: Boston Edison has established aggressive goals for three indicators of radiological performance, and improved performance is evident. The current trend of Person Rem exposure for 1988 is the best performance in this area since very early in the operating life of PNPS, and subject to continued stability of this trend, the aggressive goal for 1988 should be met. An aggressive goal of no more than one Radiological Occurrence Report (ROR) per 150 people on site was

set in 1987. For 1988, this goal is being reformulated because the number of RORs is largely dependent on the number of people working in radiologically controlled areas, which is not a function of the total number of people on site. Attention to the issue of RORs has resulted in an issuance rate which is essentially one-quarter of the rate one year ago and a zero backlog. Over this same period, the Boston Edison ROR standards have been tightened three times. This would have had the effect of increasing the issuance rate had performance remained stable, but the trend has continued downward as performance has continued to improve.

An aggressive goal of 90 percent decontamination was established. Decontamination has now reached 89.75 percent and is continuing to trend toward the goal.

Actions Remaining: Continue actions as described above.

3. Maintenance

a. NRC Observation: Management staffing. (SALP 86-99, page 19.)

PNPS Action: During the present evaluation period, the primary emphasis was on maintaining the staffing level at the authorized complement. In parallel, a study was performed to evaluate the authorized staffing level with respect to the assigned responsibilities. An integral part of this review included an estimate of manpower resources required to

meet and maintain the established performance goals within the Maintenance Section.

The presently authorized permanent, full-time Maintenance complement has recently been increased by 32 to further reduce dependence on contractor personnel. Revised job descriptions have been developed for this enlarged organization and hiring efforts are under way. Advance approval was obtained to expedite hiring to fill positions in the planning and supervisory levels.

The formation of the SED increased the direct support to the individual maintenance activities. The SED conducts in-depth research for the majority of individual Failure and Malfunction Reports (F&MRs), as well as for significant maintenance issues. The Systems Engineers provide information on the material condition of their systems' hardware and software. Not only are previously identified deficiencies reviewed, prioritized, and managed to completion, but the Systems Engineers are used to detect additional problems or weaknesses as they inspect their systems.

Actions Remaining: The process for filling presently open positions is under way on an expedited basis.

b. NRC Observation: Filling supervisory vacancies with qualified Boston Edison personnel. (SALP 86-99, page 19.)

PNPS Action: Supervisory positions have been upgraded to make them more attractive. Management discussions have been conducted with qualified staff to encourage them to

apply for supervisory positions for which they are qualified. MCIAP Item 03-011-02 provides for reviewing and expanding the formal training program to improve and maintain supervisory skills of maintenance management personnel. New supervisors are expected to complete the New Exempt Employee Orientation and the New Supervisor Orientation Program. Existing supervisors will be scheduled for training consistent with the MCIAP action item. The SED support has helped relieve some of the Maintenance overload. This improved distribution of the workload should enhance the attractiveness of the supervisory positions and encourage qualified employees to apply.

Actions Remaining: The process for filling the supervisory positions is being expedited through the Supervisory Selection System. Personnel have been identified for placement in two of the six open positions. Orientation and supervisory skills training will be offered by the Nuclear Training Department. Management attention will be required to assure that training is scheduled and completed.

c. NRC Observation: Maintenance trending of equipment problems. (SALP 86-99, page 20.)

PNPS Action: The Maintenance engineering function was expanded throughout the outage in order to address the outstanding backlog as well as the present evaluations of equipment failures. The scope of failure analysis and root cause evaluations was expanded significantly with the formation of the Systems Group (now the SED). This change has increased the

technical resources available to Maintenance for responding to individual failures and for reviewing the issues for recurring topics. The SED is performing the technical analysis on the majority of F&MRs guided by a written instruction for root cause analysis and corrective measure evaluations. The Technical Section generates failure trending reports on a six-month basis. The Maintenance Section uses the SEEK System for computer data base storage of information on the maintenance history of plant equipment; e.g., MRs issued on a pump since its installation. System unavailability studies have been performed using a minimum of six (6) years of PNPS equipment history.

Actions Remaining: Development of an integrated maintenance history database is being addressed under MCIAP issue 03-027. The SED root cause process will be formalized.

d. NRC Observation: Scheduling of second and third priority maintenance and maintenance backlog. (SALP 86-99, page 20.)

PNPS Action: As an initial step to address the maintenance planning backlog, the maintenance planning function was fully staffed. Due to the complexity and extent of the outage, the Maintenance Planning staff was augmented through the use of contractors. This temporary action supported the volume of MRs that had to be addressed throughout the refueling outage.

In order to focus on the MR priorities, a two-stage action was taken. First, the Work Scope Review Committee (WSRC)

(subsequently renamed the Work Prioritization Review Team (WPRT)), was formed to address the organizational priorities with respect to the outage schedule. The Systems Engineers have been utilized to support the WSRC/WPRT effort to prioritize the MRs in light of individual outage milestones.

The work items are prioritized by the WSRC/WPRT in the Plan-of-the-Day (POD) for scheduling and performance with appropriate physical work in progress. The "System Window" concept, described in Chapter II.B.1.c. above, is being used to organize maintenance planning. Maintenance work is scheduled for one window per week on a rotating basis.

Substantial improvement has been made in the rate of completing maintenance, as measured by the Performance Excellence Team (PET) indicators. On January 1, 1988, there were 1,945 total open MRs requiring physical work. As of April 19, 1988, there were 1,209 MRs requiring physical work -- a 37.8 percent decrease. In addition, from January through April 1988, 1,664 new MRs were generated and the work was physically completed for 1,111 of these new MRs. There were 523 power block MRs on January 1, 1988, while on April 19, 1988, there were 429 -- a reduction of approximately 18 percent. In addition, 426 new power block MRs were generated during this period, of which, 254 have subsequently been completed. The above has been accomplished with greatly reduced contractor support and a significant reduction of Boston Edison overtime, indicating improved productivity. It is expected that the expanded

permanent organization of the Maintenance Section will continue to support the present positive trends.

Actions Remaining: Management oversight and trending of the MR backlog will continue to assure that the positive trend for second and third priority MRs will be maintained.

4. Surveillance

a. NRC Observation: Programmatic description of the development, maintenance, and implementation of the Surveillance Test Program. (SALP 86-99, page 24.)

PNPS Action: The SED within the Technical Section has been assigned responsibility to provide clear guidelines, centralized control, and the strong technical focus for the Surveillance Test Program. Staffing has been augmented with a Principal Engineer and a Surveillance Test Coordinator. The Master Surveillance Tracking Program (MSTP) procedure has been revised to designate the Technical Section as having responsibility and administrative control for that program. A root cause analysis was completed to identify the cause of late or missed surveillance tests and was used as a basis for the MSTP upgrade and surveillance procedure improvements.

Actions Remaining: Continue actions as described above. Need for additional staffing is under review.

b. NRC Observation: System for control of surveillance scheduling. (SALP 86-99, page 24.)

PNPS Action: Boston Edison had inaugurated an aggressive program using state-of-the-art artificial intelligence software to replace the old MSTP with a new MSTP. A number of developmental problems with this prototype program have made it impracticable to complete. However, the data base developed to support the new MSTP has proven useful in strengthening the link between surveillance procedures and the Technical Specifications, and is being used to simplify and upgrade the existing data base.

Additional enhancements to the existing MSTP are under way based on the Institute of Nuclear Power Operations' (INPO's) Good Practice standards. The original plan to have the MSTP able to sort by plant mode, which was to have been a feature of the new prototype MSTP, is not being implemented in the upgrading of the existing MSTP at this time. However, because the primary causes for prior missed surveillances have been addressed by assigning specific responsibility for surveillances, improving the data base, and setting and using higher standards for attention to detail, use of the manual system for identifying plant mode dependence provides sufficient assurance that surveillances will be conducted as required.

Boston Edison has made significant progress in the surveillance category in the areas of MSTP validation against the Technical Specifications, upgrade of procedures, the Local Leak

Rate Test (LLRT) Program, Measuring and Test Equipment (M&TE) control, Logic System Functional Test (LSFT), the definition of "once-per-cycle" testing, and strengthening the technical focus and management of surveillances. The collective actions described above have brought about significant improvements in surveillance-related activities. Additional management attention is needed to avoid impacts on the schedule for completion.

Actions Remaining: Continue actions as described above. Increased management priority and attention will be given to support of SED schedule for MSTP upgrading.

c. NRC Observation: Review and upgrading of surveillance procedures and evaluation of results and trending. (SALP 86-99, page 24.)

PNPS Action: Surveillance procedures for PNPS have been reviewed to ensure that the procedures meet the requirements of the Technical Specifications. As a result of this review, a number of procedures were recommended for revision. The Logic System Functional Procedures were designated for overhaul and a special project was established to complete that overhaul.

Actions Remaining: Continue actions as described above. Approximately 20 procedures remain to be revised or written prior to restart.

d. NRC Observation: Corrections to the control of the program and the scheduling of surveillance tests. (SALP 86-99, page 25.)

PNPS Action: Boston Edison determined that descriptions of surveillance test frequency requirements were

potentially ambiguous; i.e., it was not always possible to distinguish between the correct application of once-per-cycle and once-per-refueling outage surveillance intervals. To clarify this distinction, the MSTP data base has been revised to distinguish between once-per-cycle (not greater than eighteen-month interval) and once-per-refueling outage surveillance intervals.

Actions Remaining: Continue actions as described above.

e. NRC Observation: Local Leak Rate Test (LLRT) Program administration and technical content. (SALP 86-99, page 25.)

PNPS Action: The MSTP has been updated to reflect that LLRT components are handled on an individual basis. Two rounds of LLRT tests have been conducted, one in the spring of 1986 and the other in calendar year 1987. A multi-disciplinary LLRT failure analysis team has been established to conduct causal analysis and has issued an interim report.

A Valve Betterment Program (Phase 2) was initiated and significant design improvements have been made to selected valves; e.g., main steam isolation valves (MSIVs) and feedwater check valves. This phase of improving the administrative controls and technical features of the LLRT Program has been completed.

Actions Remaining: Continue actions as described above.

f. NRC Observation: Electrical equipment safety-related settings in controlled documents. (SALP 86-99, page 25.)

PNPS Action: In response to this item, Boston Edison determined that it was necessary to evaluate the protective relay setting and test criteria and to provide written criteria to the Maintenance Section. It was also determined that it was necessary to revise and update controlled documents for all 4KV circuits and 480V load centers to reflect protective relay/breaker setting and testing. Procedural controls for calibration and testing have been upgraded. Protective relay setting and test criteria have been evaluated, revised, and documented for use by the Maintenance Section. Protective relay/breaker setting and testing requirements for safety-related 4KV circuits, 480V load centers and for 480V control centers and non-safety 4KV circuits have been revised and documented.

Actions Remaining: Review for completeness of scope in the direct current (DC) distribution system will be completed before restart.

g. NRC Observation: Measuring and Test Equipment (M&TE) Control Program. (SALP 86-99, page 25.)

PNPS Action: Boston Edison established central M&TE issue areas and segregated the calibration equipment. An M&TE program to address installed instrumentation was established. Phase 1 of this effort has been completed by the

Maintenance Section for portable instrumentation. The Phase 2 program has begun for installed instrumentation.

Actions Remaining: Continue actions as described above. Particular management attention will be required in review of results and implementation of corrective action.

5. Fire Protection

a. NRC Observation: Maintenance and improvement of station fire protection equipment. (SALP 86-99, page 27.)

PNPS Action: A number of steps have been taken to reduce the reliance on compensatory measures. Inoperative systems requiring compensatory measures receive review daily, are assigned a priority level, and are incorporated in the POD. Compensatory work items receive high priority at the daily meetings. Where fire watches are being used as compensatory measures, responsibility for resolution of the problem areas in which the fire watch is maintained has been assigned to specific individuals. This assures proper accountability. Lastly, program effectiveness is now being continually monitored. Trends in fire protection, systems status, and compensatory measures are provided in periodic reports to management. This reporting will be continued as an effective tool of management oversight.

In addition, Boston Edison has taken many other steps to maintain and improve fire protection equipment. In December 1986, Boston Edison centralized the fire protection function at

PNPS through the establishment of a new group leader position (now the Fire Protection Division Manager). The relevant operating procedure is being revised to provide for Nuclear Organization changes and to reflect the Fire Protection Division reorganization and its increased scope of responsibility. A fire protection status board was developed in January 1987, for use by Fire Protection and Control Room personnel, as a tool for assessing fire protection system operability. This is maintained by the Fire Protection Division as a systems management tool. The WPRT, which meets regularly, determines what the priorities are for the accomplishment of maintenance work. This includes maintenance work related to fire protection.

Actions Remaining: Continue actions as described above.

b. NRC Observation: Fire watch personnel training and site management follow-up; fire brigade training and training records. (SALP 86-99, page 27.)

PNPS Action: Boston Edison has taken the following actions to improve the preparedness of the fire brigade and the competency of personnel performing fire watch duties:

(1) As stated above, a dedicated Fire Protection Group Leader (now Fire Protection Division Manager) position was established for the site in December 1986.

(2) The Nuclear Training Manual was revised to make attendance mandatory at required training courses. This revision was completed in January 1987.

(3) Thirty-three site-specific training modules were written to upgrade the brigade training program. The program receives regular review and revision by the fire brigade Instructor.

(4) As a requirement for brigade membership, it is now mandatory that each member participate in two drills each year. This requirement was established in November 1986.

(5) The triennial Fire Protection Audit 87-14 was completed on June 5, 1987, with no deficiencies being reported.

(6) A fire brigade Instructor was hired in June 1987. The fire brigade Instructor is Commonwealth-certified. Prior to joining Boston Edison, he was an instructor at the Massachusetts Fire Academy and a lieutenant in a local fire department.

(7) The revised fire brigade procedures require that performance be evaluated on a team basis.

(8) Records are now being maintained to ensure continued compliance with NRC fire protection requirements. The fire brigade Instructor has established a record system and report of membership training for the Fire Protection Division Manager, who issues the roster of qualified members of the fire brigade. This system has been in place since February 15, 1987.

(9) Steps have been implemented to improve drill effectiveness and to establish critique procedures. In particular the drill procedure was revised to include the requirement of a written scenario and critique following the drill.

(10) Mandatory training requirements have also been established for personnel who participate in fire watches. The accompanying procedure was revised to document the training requirements.

Actions Remaining: Continue actions as described above.

c. NRC Observation: Fire barrier surveillance procedures. (SALP 86-99, page 28.)

PNPS Action: Boston Edison has taken steps to improve the fire barrier surveillance procedures. First, those barriers which are required by 10 C.F.R. Part 50, Appendix R, or by licensing commitments to the NRC, have been specifically identified. Fire barrier walkdowns to identify barriers and penetrations were completed in May 1987, and corrective actions were initiated.

At the present time, the Operations Section has the responsibility for the fire barrier surveillances. In the long term, Boston Edison will transfer responsibility for conducting surveillances of fire protection systems from the Operations Section to the Fire Protection Division.

In 1987, work was begun to repair degraded seals and to install new seals where required. That work is now complete and was done in accordance with a Plant Design Change (PDC) package. In order to make certain that degraded seals are repaired and new seals are installed where required, the administrative controls and tracking system has been upgraded.

Actions Remaining: Continue actions as described above.

6. Emergency Preparedness

a. NRC Observation: "Continue to pursue resolution of off-site issues." (SALP 86-99, pages 29-30.)

PNPS Action: While offsite emergency preparedness is outside the scope of this report, this matter was addressed in SALP 86-99, and accordingly, this brief discussion is provided for the sake of completeness. Boston Edison has instituted an effective program to bring about improved offsite emergency preparedness. This has been accomplished with full recognition that offsite emergency planning is the responsibility of Commonwealth and town officials. Boston Edison has provided assistance in a manner that has allowed the Commonwealth and the towns to make significant improvements in their emergency preparedness programs. Personnel of Boston Edison's Emergency Preparedness Department have established good working relationships with the various Commonwealth and town officials responsible for offsite Emergency Preparedness programs. Over the last nine months, relationships with these officials have improved considerably. Boston Edison has provided necessary resources to the towns to enable them to fulfill their emergency preparedness program objectives. Boston Edison has entered into agreements to provide each town with funding for:

- o a full-time Civil Defense staff position;

- o upgraded emergency response facilities and equipment; and,
- o compensation for time spent in training.

All of the communities involved in the offsite program have accepted the offers of assistance from Boston Edison. The Boston Edison Emergency Preparedness Department Staff is continuing to work closely with the offsite officials and agencies in support of their efforts, as completion of the upgraded Offsite Emergency Preparedness Program rests with these officials.

Actions Remaining: Continue actions as described above.

7. Security and Safeguards

a. NRC Observation: Management attention and resources in Security. (SALP 86-99, pages 31-32.)

PNPS Action: Since January 1987, Boston Edison has taken a number of steps to strengthen and build upon the security improvements made during the last SALP period. At the end of the last SALP period, in December 1986, the highest position for full-time security was elevated from Security Supervisor to a Section Manager level and an individual was hired to fill that management position. Boston Edison established full coverage of security operations by appointing Security Shift Supervisors for Security Operations. The Shift Supervisors took responsibility beginning in February 1987. Moreover, three additional Boston Edison staff positions have been created in the security organization in the administrative, compliance, and

technical areas. In January 1987, several supervisory positions were created within the contract force: an Access Control Supervisor position was created, and Central and Secondary Alarm Station Operators were assigned responsibilities as supervisors. As a result of these actions, the supervisor to patrolman ratio went from 1-20 to 1-10 or less and has remained at that level.

Actions Remaining: Continue actions as described above.

b. NRC Observation: Vital area barrier degradation. (SALP 86-99, page 33.)

PNPS Action: Boston Edison initiated a series of walkdowns to inspect the vital area barriers. The purpose was to identify openings where corrective action was needed and where maintenance was necessary to repair the deficiencies. MRs and PDCs were initiated where necessary to correct identified openings. The necessary work has now been completed and compensatory measures are unnecessary. In March 1988, the Nuclear Engineering Department (NED) conducted a walkdown to ensure the integrity of the barriers and no degradations were identified. As part of an ongoing responsibility, the Security Technical Specialist reviews PDC packages and also interfaces with the Maintenance Section in order to make certain that there are no adverse impacts on security.

Actions Remaining: Continue actions as described above.

c. NRC Observation: Use of compensatory measures. (SALP 86-99, page 32.)

PNPS Action: Since January 1987, the Security Supervisor has attended security-related seminars and exhibits to broaden his knowledge of available equipment to use for compensatory measures. NUREG-1045 was utilized by the security force as basic guidance for determining effective compensatory measures. There is confidence that any compensatory measures that might be necessary in the future will be appropriate to the situation. In addition, increased management attention to security-related maintenance work has reduced the number of compensatory measures currently required, as described in Chapter II.B.8.c below.

Actions Remaining: Continue actions as described above.

d. NRC Observation: Effectiveness of Protected Area Lighting. (SALP 86-99, page 32, Special Inspection.)

PNPS Action: A construction program has been undertaken to improve protected area lighting. That program is now 95 percent complete. The Security Section, in conjunction with the Maintenance Section, also monitors the lighting on a periodic basis using a calibrated light survey meter to verify that lighting is adequate. Where necessary, compensatory measures are taken for areas needing modification or repairs.

Actions Remaining: Complete installation of remaining lighting.

e. NRC Observation: Coverage of the protected area: perimeter isolation zone on the inside of the perimeter barrier by closed circuit TV (CCTV) surveillance. (SALP 86-99, page 32, Special Inspection.)

PNPS Action: A construction program was undertaken to replace and upgrade the CCTV system. The CCTV for perimeter alarm assessment is operational and complete. The overall CCTV construction program is 80 percent complete. The remaining 20 percent of CCTV construction is for cameras of the pan-tilt-zoom-type which will be used to enhance perimeter assessment. The CCTV construction program is scheduled for completion in late 1988.

Actions Remaining: Complete the remaining 20 percent of camera installation as scheduled.

f. NRC Observation: Operability of protected area Intrusion Detection Systems (IDSs) alarm zones. (SALP 86-99, page 32, Special Inspection.)

PNPS Action: Boston Edison has undertaken a program to replace and upgrade the protected area IDS. That program is approximately 95 percent complete and operational, with completion expected shortly.

Actions Remaining: Complete the remaining 5 percent of construction work.

g. NRC Observation: Security computer system. (SALP 86-99, page 32, Special Inspection.)

PNPS Action: PNPS has developed specifications for a replacement computer. A purchase order was awarded to replace the security computer, the installation of which is expected in the first quarter of 1989, with completion in the second quarter of 1990. Software changes were made in March 1987, to improve the current security computer performance. As a result, overall security computer system performance has improved.

Actions Remaining: Continue actions as described above.

h. NRC Observation: Maintenance of the security system equipment. (SALP 86-99, pages 33-34.)

PNPS Action: Boston Edison created the position of Security Technical Specialist to address maintenance of the security equipment. The individual in this position has responsibility to provide Security input to establish priorities for security equipment maintenance. Open MRs for security equipment are tracked on the POD and PET indicators are monitored by cognizant management. Moreover, Station Instructions have been developed for preventive maintenance on security equipment. The procedures have been reviewed by the Operations Review Committee (ORC).

Actions Remaining: Continue actions as described above.

i. NRC Observation: Security personnel overtime. (SALP 86-99, page 32.)

PNPS Action: Boston Edison has implemented a policy that limits the number of hours that security personnel can work within a given work week. Current overtime is within company overtime limits. Payroll sheets are audited in order to identify any deviations from Boston Edison's policy regarding overtime. Presently, the security force works eight-hour shifts. With the reduction of compensatory measures, the size of the guard force is adequate to perform its duties with minimal overtime. As noted above, the supervisory staff has been increased to maintain a favorable supervisor to staff ratio of approximately 1 to 10.

Actions Remaining: Continue actions as described above.

j. NRC Observation: Resolution of NRC-identified problems. (SALP 86-99, page 32.)

PNPS Action: Boston Edison has taken many steps to improve the overall effectiveness of security. A Security Manager has been recruited and has joined the Boston Edison security staff. An expanded Boston Edison security staff is in place. The Security Manager temporarily reported to the Senior Vice-President - Nuclear in order to direct additional management attention to this area. Now that the transition to the long-term organization has been implemented, the Security Section reports to the Plant Support Manager. The Security training program for both initial qualification and

requalification of general employees has been augmented. That program has been enhanced and updated. Moreover, a security awareness training program, which includes an overall orientation on the purpose of security and general requirements for physical protection at nuclear power plants, has been developed and presented to corporate officers, plant staff, and supervisors. General Employee Training and special training sessions assure that corporate and plant staff and supervisors remain security-conscious. As a result, corporate and plant staff now have a better understanding of NRC performance objectives and can carry out duties related to achieving these objectives in a more knowledgeable manner and with greater understanding and attendant commitment.

Actions Remaining: Continue actions as described above.

k. NRC Observation: Post orders for required security duties. (SALP 86-99, page 33.)

PNPS Action: Boston Edison retained a consultant to review the training program in order to identify weaknesses and instructions that might not be consistent with current security practice. Current post orders were then reviewed by Boston Edison Security Operations for applicability and content. Moreover, a Station Instruction has been established for developing, reviewing, and approving post orders. Training instructors were assigned to the guard shifts in order

utility experience. These improvements will be implemented according to the results of these analyses.

Actions Remaining: Continue actions as described above.

e. NRC Observation: QA support from the NED (SALP 86-99, page 42.)

PNPS Action: As stated in SALP 86-99 this item refers to an apparent lack of senior management action to appropriately involve the NED in station problems requiring engineering support. As indicated in Chapter II.B.12.a. below, Senior Management has placed more emphasis on the timely close-out of QA concerns, and the NED is now appropriately involved in resolution of QA concerns at PNPS.

Actions Remaining: Continue actions as described above.

11. Training and Qualification Effectiveness

a. NRC Observation: Number of experienced personnel available for shift duties. (SALP 86-99, page 44.)

PNPS Action: Boston Edison has increased the number of Operations personnel on shift as described in Chapter II.B.1.g. above. In addition, Boston Edison has given significant attention to the operator training program. Illustrative of the improvement is the fact that in 1987, fourteen Reactor Operator license candidates and two Senior Reactor Operator license candidates were examined by the NRC. All sixteen candidates passed and were issued NRC licenses (with the restric-

to provide on-the-job training as to actual security practice, and security lesson plans were reviewed and updated for content.

Actions Remaining: Continue actions as described above.

8. Outage Management and Modification Activity

a. NRC Observation: Onsite outage management structure. (SALP 86-99, page 36.)

PNPS Action: In order to increase the effectiveness of planning and outage management during the current outage and shutdown, the Maintenance Section and the Planning and Outage Department, with the assistance of the Plant Manager, are realigning work package planning functions. Major work package planning will be the responsibility of the Planning and Outage Department, which will also schedule the work, once the work package is ready, coordinating through the "System Window".

Actions Remaining: Continue actions as described above.

b. NRC Observation: Site and corporate management attention to the surveillance program. (SALP 86-99, page 36.)

PNPS Action: The Planning and Outage Department is overseeing revisions to the LSFT to improve the surveillance program. Presently, the LSFT and once-per-cycle surveillance tests are being integrated into the restart schedule. Additional information regarding surveillance program improvements is presented in Chapter II.B.4 above.

Actions Remaining: Continue actions as described above.

c. NRC Observation: Security compensatory measures. (SALP 86-99, page 36.)

PNPS Action: In order to improve attention to reduction of security compensatory measures, Boston Edison has placed security compensatory measures in the front part of the POD, where they are reviewed and tracked daily. The adequacy of this process will be evaluated periodically and any necessary adjustments will be made to improve it further. Moreover, security MRs are being prioritized during the WPRT Meeting each day, and are evaluated for implementation at another daily meeting. This assures that the security MRs are properly prioritized, staffed, scheduled, worked, and ultimately closed, which will alleviate any undue reliance on security compensatory measures. The PET Indicators are closely monitored to assure that security MRs are being closed out. For a period of time, compensatory measures were tracked and weekly reports were generated and provided to management. This method of tracking is no longer beneficial in light of the current prioritization of security MRs and PET Indicators.

Actions Remaining: Continue actions as described above.

d. NRC Observation: Isolation of the major plant components. (SALP 86-99, page 36.)

PNPS Action: Boston Edison has increased management attention to the isolation of major plant components by using the four-week rolling schedule with "System Windows" to implement isolations and to schedule physical work. This process is successful and is improving weekly as:

(1) There has been a reduction in the number of times that systems have been removed from service to perform work;

(2) The "packaging" of systems work permits several MRs to be accomplished including priority 2 and 3 MRs;

(3) Planners are now able to prepare task-ready packages in advance of the next window.

Actions Remaining: Continue actions as described above.

e. NRC Observation: Programmatic guidance for post-work testing. (SALP 86-99, page 36.)

PNPS Action: Boston Edison has implemented programmatic guidance to improve post-work testing (PWT). Where applicable, the Planning and Outage Department is scheduling both maintenance and plant design PWT. Maintenance has issued a Station Instruction for Post-Work Test Matrices. A Station Procedure on PWT directs personnel to the new Station Instruction

and Incorporates INPO recommendations for PWT. Outage Services is scheduling the PWT for those which require physical work.

The computerized data base for MRs tracks the status of MRs requiring physical work so that the MRs are filed in the appropriate test files when that physical work has been completed; e.g., the PWT file, the PWT requiring system availability file, or the PWT requiring plant start-up file. This enhances the capability to schedule PWT. Additional improvements to planning and scheduling of PWT for completed MRs will be implemented as a long-term action item in the MCIAP.

Action Remaining: Continue actions as described above.

f. NRC Observation: Security involvement with plant modifications. (SALP 86-99, page 36.)

PNPS Action: In order to improve Security involvement with plant modifications, Plant Design Changes (both conceptual and detailed) and major Field Revision Notices (FRNs) are now issued to Security for review and comment before implementation. This enables Security to provide advice regarding the impact that the proposed changes might have on Security. The Security staff has been increased so that it may provide a timely and effective response. Further, a Security Specialist has been assigned to oversee major security modifications.

Actions Remaining: Continue actions as described above.

9. Licensing Activities

a. NRC Observation: Provision of information to NRC to close licensing issues, submittal of the Long Term Plan, and clarification and correction of the Technical Specifications. (SALP 86-99, page 38.)

PNPS Action: Boston Edison has undertaken a systematic effort to streamline the functions of the licensing and compliance groups by transferring certain non-regulatory activities out of those organizations and into the appropriate organization. For example, the MSTP and Nuclear Plant Reliability Data Systems (NPRDs) have been transferred to the SED.

In order to enhance the capability to comply with 10 C.F.R. §§ 50.72 and 50.73, formal procedures have been developed for reportability reviews. Also, Regulatory Section personnel training has been initiated concerning: (1) NRC regulatory requirements and guidance affecting the compliance function; and (2) the content of the Technical Specifications and the Final Safety Analysis Report (FSAR), and Plant Systems. Training on selected portions of the FSAR and the development of the reportability review procedures have increased the ability to effectively analyze partial Engineered Safeguards Feature (ESF) actuations.

Improved work practices and methods are being developed including a regulatory work management system which incorporates the lessons learned from work with Appendix 10 of the Restart Plan and the MCIAP. This system is designed to ensure that

assignments, schedules, progress, and close-outs can be effectively tracked and that the status in any of these areas can be reported to management in a manner that permits management oversight and proper accountability. The use of this tracking system will improve the ability of the Regulatory Section to respond to the NRC on a timely basis. The regulatory work management system will also maintain the ability to generate present reports, trace source documents, and facilitate the interface with NRC on open items.

The method of assembling packages to close out NRC inspection issues has been formalized. Performance in this area has shown significant improvement in the past year, as evidenced by the decrease in the number of NRC open items from 197 on November 5, 1987, to 126 on May 16, 1988. During this period, 25 NRC inspections which had the potential to generate new open items were held at PNPS.

Extensive effort is being made to enhance the technical competency of the Regulatory Section as a whole. In addition to the training identified above, every attempt will be made to fill openings with personnel who have a broad technical background plus operating experience, regulatory experience, compliance experience, an understanding of the Technical Specifications, and the ability to interface and work with a matrix organization.

The regulatory function will be further strengthened by the introduction of an "issue manager" concept. For example, in the rule making area, this will provide the capability to analyze

the intent of a proposed rule; to examine hardware or software alternatives which would meet the intent of the rule making; to develop licensing positions and strategy vis-a-vis a regulation; and to close out commitments that have been made regarding regulatory compliance. Continuing development of compliance methods also will be part of the "issue manager" concept.

A tracking system is being implemented in order to better manage the work within the Regulatory Section. Boston Edison has improved its processes for providing information to the NRC to close licensing issues through greater emphasis and management attention to the process. In addition, development of the Long Term Plan is ongoing under the guidance of Planning and Outage Management. Finally, steps are being taken to clarify the Technical Specifications and to assure that they remain updated as described in the Restart Plan, Vol. 2, Rev. 2., Appendix 10, Issue 09-001. The major portion of this effort is scheduled for completion after restart.

Actions Remaining: Continue actions as described above.

10. Engineering and Corporate Technical Support

a. NRC Observation: Reorganization of the NED to expand the Field Engineering office and place the Licensing group in the NED. Shortly afterwards, the Compliance Group was also added to the NED. (SALP 86-99, page 40.)

PNPS Action: The licensing and compliance

areas are discussed in Chapter II.B.9 above. At the present time, the staff level of the NED is 86 percent of full complement. One hundred twelve positions are authorized, sixteen are unfilled. Four positions are temporarily being filled by contractors. The contractor positions are in the Regulatory Section. The NED is actively recruiting to fill the staff vacancies. As part of the recently completed organizational review, a decision was made to combine the Licensing and Compliance Divisions into a discrete department. This decision will be implemented by the end of the Power Ascension Program.

Actions Remaining: Continue actions as described above. Continue to aggressively pursue actions to achieve the goal of a full complement using the NED's historically effective selection process.

b. NRC Observation: Installation of the MSIV. (SALP 86-99, page 41.)

PNPS Action: The NED developed a comprehensive MSIV pilot poppet action plan. The specific problem identified with the MSIV was corrected with an improved design upon which the NRC commented favorably. An investigation was undertaken for similar problems through a review of past modifications. Preventive action was initiated through the issuance of a written directive to all NED personnel. Verification of the effectiveness of the modification will be obtained during power ascension.

Actions Remaining: Complete the MSIV test planned during power ascension to ensure that the MSIV will open against differential pressure.

c. NRC Observation: Plant design change (PDC) process. (SALP 86-99, page 42.)

PNPS Action: The NED has streamlined the design change process for improved efficiency. It has refined the PDC process to reduce unnecessary paperwork and levels of review for minor design changes of a limited scope; expanded the equivalency process; and improved the understanding of the non-conformance report (NCR) process. Moreover, the design change process is continually assessed to ensure that it is efficient, while maintaining an appropriate level of control. These actions have been effective as evidenced by the fact that subsequent design changes have been made by the appropriate design process, while maintaining a high level of design control.

Actions Remaining: Continue actions as described above.

d. NRC Observation: Detailed design basis documents for plant equipment and safety instrument settings and prompt implementation of the licensee's corrective action program. (SALP 86-99, page 42.)

PNPS Action: The NED is also continuing to improve design basis documentation. It has initiated a set point program, investigated other improvements that could be affected, and is assessing the potential for these improvements through a needs assessment that considers resource availability and other

tions as noted in Chapter II.B.1.g. above). The overall average for the written examination was above 88 percent. Additionally, there was strong performance on the oral and walkthrough portions of the examination. More recently, after installation of the simulator, the December class had a notably high familiarity with normal Control Room evolutions and indications to be expected during both plant shutdown and power operations. As discussed below, the new PNPS simulator became available for use during the latter part of this particular training session.

Since its availability, the PNPS Control Room simulator, which is a full scope, state-of-the-art simulation complex, has seen extensive use. It arrived at the Chiltonville training center in May 1987. The simulator has been used as follows:

(1) Plant start-up refresher training was conducted for the NRC licensed operators and qualified STAs in Montreal from March 10, 1987, through April 17, 1987.

(2) Training was conducted for all NRC licensed operators and qualified STAs on the new PNPS EOPs, from August 31, 1987, through October 2, 1987.

(3) From October 13, 1987, through December 31, 1987, the simulator was used for the following activities:

(a) To complete the annual NRC licensed operator and qualified STAs' simulator training requirements;

(b) To prepare an initial RO/SRO licensed training class for an NRC licensing examination;

(c) To administer performance examinations and oral examinations by NRC staff to Boston Edison's 1987 RO/SRO licensing class; and

(d) To further prepare operating crews for start-up by allowing additional practice time on the simulator. In total, 622 person-days of training were conducted on the new simulator in 1987.

(4) From January 1, 1988, to March 1, 1988, the simulator was used for the following:

(a) Qualification training for Control Room peer evaluators;

(b) Validation of the new PNPS EOPs; and

(c) Additional EOP usage training concurrent with Control Room team skills and effective communications training for the NRC licensed operators and qualified STAs.

Actions Remaining: None.

b. NRC Observation: Radiological Environmental Technical Specifications (RETS) training of licensed operators. (SALP 86-99, page 44.)

PNPS Action: The Nuclear Training Department will reconfirm that the Operations staff has the appropriate level of knowledge regarding the RETS in Amendment No. 89 which was issued March 1, 1986. After review of the RETS and a re-evaluation as to the appropriate level of knowledge required, the Nuclear Training Department will conduct any necessary additional training.

Actions Remaining: Continue actions as described above.

c. NRC Observation: Fire brigade and fire watch training. (SALP 86-99, page 44.)

PNPS Action: Boston Edison has taken vigorous steps to improve the fire brigade and fire watch training. This was discussed previously in the Fire Protection discussion in Chapter II.B.5. Each fire brigade member now participates in at least two drills per year. The operators assigned to the fire brigade have completed the requirement for

fire truck training, and procedures have been revised to provide additional realism to the drill scenarios.

Actions Remaining: Continue actions as described above.

12. Assurance of Quality

a. NRC Observation: Licensee responsiveness to prior SALP report and Region I Diagnostic Team report. (SALP 86-99, page 51.)

PNPS Action: Boston Edison has taken vigorous steps to strengthen its ability to assure quality through appropriate management direction and involvement. The Restart Plan was developed by Boston Edison, submitted to the NRC in July 1987, and accepted by the NRC in May 1988. Boston Edison has conducted detailed assessments of PNPS maintenance and radiological performance and has developed the MCIAP and the RAP to address programmatic issues in these areas. Significant improvements are also being made in the MSTP to improve the scheduling of surveillance testing. The MCIAP is approximately 47 percent complete. Because it is a long-term program, it will be completed after restart; however, those items which have been designated as required for restart will be completed prior to restart. The RAP is approximately 22 percent closed, with the majority of the RAP being scheduled for completion prior to restart. MSTP improvements are addressed in Chapter II.B.4. above. F&MRs are being used to identify problems in the plant. The root cause analysis performed by SED is guided by a written instruction which will be converted to a station procedure. A

critique process has been established which is being documented in a procedure currently under development.

To stabilize the management team and to improve the onsite organizational structure, a revised PNPS organization was put in place in January 1988, to provide strong centralized control of station activities, to limit the span of control of the department and section managers to a more manageable size, and to distribute the work load more evenly. Chapter IV of this report describes the new organizational structure.

Actions Remaining: Continue actions as described above.

b. NRC Observation: Corporate Management attention to QA findings. (SALP 86-99, page 48.)

PNPS Action: Boston Edison has established a weekly meeting between the Senior Vice President - Nuclear, the Station Director, the Plant Manager, and the QAD Manager to ensure that QA concerns receive the highest level of corporate attention. In addition, there is a weekly meeting between the QAD and Station Organization personnel to address prompt disposition of quality-related problems. These weekly meetings provide useful forums for identifying and addressing problems and concerns in the QA and corrective action processes and contribute to improved management responsiveness in this important area of operational performance. At the meeting with the Senior Vice President - Nuclear, as well as at weekly meetings between members of the QAD and managers of the Station Organization, open

DRs and QA concerns are addressed. These meetings have greatly improved the communication of issues and concerns and are effective in supporting rapid problem resolutions. At the present time, there are no overdue DRs.

Additionally, to further strengthen management's role in the corrective action process, the Boston Edison Quality Assurance Manual (BEQAM) has been revised to require a response from the appropriate manager to QAD recommendations. Unlike DRs, recommendations in the past did not require a specific response, and implementation was to some extent left to the discretion of the individual manager. The Nuclear Organization revised the BEQAM to require that responses to recommendations made as a result of audits/surveillances be made in writing to the appropriate vice president or organization head with copies to the QAD. In addition, a QAD procedure was revised to implement a formal tracking system for QA Recommendations (QARs). Monthly status reports of open QARs are issued. The resulting management attention has driven the trend of open QARs downward.

Actions Remaining: Continue actions as described above.

c. NRC Observation: Timely and comprehensive corrective action to NRC issues - Overtime control. (SALP 86-99, page 49.)

PNPS Action: Boston Edison has implemented a comprehensive computer-based system to monitor overtime of on-site personnel based on gate sheet information. Reports of PNPS use of overtime are then made directly to the Station Director on

a weekly basis. These are backed up with biweekly payroll data. Deviations from Boston Edison's corporate policy on overtime, which is more restrictive than the NRC's published criteria, are being identified and addressed.

Actions Remaining: Continue actions as described above.

d. NRC Observation: Onsite engineering resources (SALP 86-99, page 49.)

PNPS Action: Boston Edison established the SED in January 1987. Organizationally it is placed within the onsite Technical Section and has an authorized complement of 28. Presently, it is staffed with 25 Boston Edison employees and 3 contractors. Two Boston Edison employees will be transferred to the Division in May 1988 and one new outside hire will join the Division in June 1988, thus ending the need to fill positions with contract employees. The full complement of 28 should be reached within a short period of time.

Actions Remaining: Continue actions as described above.

e. NRC Observation: Functional areas of radiological controls, surveillance, fire protection, and security. (SALP 86-99, page 49.)

PNPS Action: The steps that have been taken to address these areas are discussed under their respective headings within Chapter II.B of this report. They are summarized below.

(1) Radiological Controls: PNPS personnel other than those in the radiological organization are now participating in radiological protection activities. For example, the Plant Manager has been named as the Chairman of the As Low As Is Reasonably Achievable (ALARA) Committee. The Plant Manager also serves as a member of the ALARA Oversight Committee. The Station Director has issued a uniform policy of discipline for violations of high radiation area doors to ensure accountability for personal responsibility in the conduct of radiological activities. In addition, a multi-disciplinary task force reviewed previous high radiation area violations and developed a set of recommended actions to ensure compliance in this area. Further description is provided in Chapter II.B.2 above.

(2) Surveillance: As described in Chapter II.B.4. above, centralized control of the surveillance program has been assigned to the Technical Section and the MSTP and the associated data base are being upgraded.

(3) Security and Fire Protection: Increased attention is now being given to security and fire protection equipment in order to maintain these systems in a state of readiness. Specific goals for the number of open MRs have been established to focus management's attention on the fire protection and security systems. Representatives from Security and Fire Protection now meet directly with the WPRT to ensure that MRs in these functional areas receive prompt attention. During April and May of 1988, the number of fire protection MRs ranged

between 30 and 50, as against a goal of 40. With respect to security, there are 26 open security MRs. The goal is to have no more than 20 security MRs open at any time. PNPS is devoting additional resources to reach that goal, and even though it has not yet been reached, the outstanding MRs do not compromise the security system. Further discussion of Boston Edison's efforts in the Fire Protection and Security areas is found in Chapters II.B.5. and II.B.7. above, respectively.

Actions Remaining: Continue actions as described above.

13. Evaluation of Current State of Readiness in Light of Major SALP 86-99 Issues

The foregoing discussion summarized Boston Edison's response to each of the major SALP 86-99 observations and identified the actions remaining for restart in regard to each such observation.

NRC's SALP numerical ratings system includes the following definitions:

> Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety is being achieved.
>
> Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and reasonably effective so that satisfactory performance with respect to operational safety is being achieved.
>
> Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involve-

ment is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety is being achieved.

In addition, NRC's SALP rating system includes trend categories as follows:

> Improving: Licensee performance has generally improved over the last part of the SALP assessment period.
>
> Declining: Licensee performance has generally declined over the last part of the SALP assessment period.

A trend is assigned only when, in the opinion of the SALP board, the trend is significant enough to be considered indicative of a likely change in the performance category in the near future. For example, a classification of "Category 2, Improving" indicates the clear potential for "Category 1" performance in the next SALP period.

Based upon the discussion presented in Chapter II.B. above, Boston Edison concludes the following:

(1) The current state of readiness in light of the major SALP 86-99 issues indicates an improved performance trend in all areas which were rated a "3" in SALP 86-99 (radiological controls, surveillance, fire protection, security, and assurance of quality).

(2) All SALP functional areas have been evaluated and, subject to closure of the identified actions remaining, Boston Edison will have resolved the

issues identified in the SALP that are necessary for restart.

III. INDEPENDENT PERFORMANCE EVALUATIONS

This Chapter presents a summary description of several independent performance evaluation processes in use at PNPS on an ongoing basis, examples of results from those processes, and a summary assessment of those evaluation processes.

A. Peer Evaluation Program

1. Process

The Peer Evaluation Program, an element of the Power Ascension Performance Evaluation and Assessment Program, was established in accordance with the description in the Power Ascension Program, which was submitted to the NRC by Boston Edison's letter number 87-163, dated October 15, 1987. The Peer Evaluation Program is designed to provide direct support to the Team in its evaluations of plant and personnel performance. The peer evaluators observe specific plant evolutions or support activities of interest and report the results of their observations and evaluations to the Team via the Power Ascension Project Office.

In November 1987, a temporary organization for the conduct of the Power Ascension Performance Evaluation and Assessment Program was put into effect until completion of the Power Ascension Program. This consisted of a Project Office, which was established to ensure that preparations for the conduct of the Power Ascension Performance Evaluation and Assessment

Program were effective. The Program Manager for the Director of Special Projects was assigned to lead this Project Office and, as the Project Officer, was assigned responsibility for: the formulation of Performance Standards and Evaluation Guidelines; the coordination of the selection of peer evaluators; the formulation and oversight of the training plans for the evaluators; and the coordination of the evaluation and assessment process prior to and during power ascension.

The Performance Standards and Evaluation Guidelines used for PNPS peer evaluations were developed under the direction of the Project Officer, with substantial input and review from the line organization. Performance standards, which have been successfully used in both commercial and naval nuclear programs, were reviewed for applicability and relevant portions were incorporated. The Performance Standards and Evaluation Guidelines have been issued as a Nuclear Organization Procedure (NOP) and are not only being used as the standard against which the peer evaluators measure performance, but are also being adopted throughout PNPS as the Boston Edison standards against which Nuclear Organization performance is measured.

Peer evaluators for the pre-power ascension period and the testing and power ascension period were selected from the following disciplines:

(1) Operations;

(2) Maintenance;

(3) Radiological Protection;

(4) Chemistry;

(5) Technical Support;

(6) Security;

(7) Fire Protection; and

(8) Engineering

Alternates were also selected and are being trained to provide backup support for absences and potential additional peer evaluator coverage should the Team determine that additional coverage is necessary.

The peer evaluators completed a peer evaluator training program formulated and approved by the Project Officer and the Nuclear Training Department. Training conducted by the Training Department included both a classroom examination and a practical exercise to verify the peer evaluators' understanding of the following:

(1) Purpose, scope, organization, administration, roles, and responsibilities in the Power Ascension Program;

(2) Performance Standards and Evaluation Guidelines for PNPS;

(3) Skills for identifying and responding appropriately to personnel, procedural, and plant equipment problems in accordance with the Power Ascension Program and systematic diagnostic strategies;

(4) Skills for properly observing, recording, and evaluating start-up work activities against established criteria; and

(5) PNPS procedures, professionalism, and safe work practices.

In January 1988, after completing their training, an initial group of peer evaluators began performing evaluations and providing data to PNPS management through the Project Officer. Information from the peer evaluators supplements the normal line organization communications. Guidelines for follow-up and feedback of lessons learned were developed to ensure that the peer evaluator observation comments and recommended corrective actions are fed back to the operators, evaluators, and other plant personnel in a timely and effective manner. The Operations peer evaluator, designated the on-shift evaluation team leader, is the single point of contact between the Nuclear Watch Engineers (NWEs), their operating crews, and the peer evaluator team. Information normally will be transmitted to the personnel on shift through: peer evaluator comments in the pre-shift briefing book maintained by the NWE; the pre-shift briefing conducted by the NWE and attended by the on-shift evaluation team

leader; and post-shift critiques when evaluator findings warrant them. In those rare circumstances where concerns of an urgent nature might be noted, the evaluation team leader would communicate them directly to the NWE during the course of the shift, but this would be done without interfering with the NWE or operators in the execution of their line duties.

The Project Officer maintains a summary of pertinent results of peer evaluations for use by the Team and line management. Periodically, the status of corrective actions in response to peer evaluator comments is provided to the peer evaluators. This feedback will enable the peer evaluators to monitor the effectiveness of corrective measures and will help correct possible misunderstandings, and thus, improve the substance and validity of peer evaluator comments.

2. Results of Peer Evaluations

Since January 1988, the peer evaluators have been conducting peer evaluations. The following examples of observations of the peer evaluators illustrate positive trends or indicators:

(1) Prevention of recurrence of certain types of deficiencies through effective use of feedback has been noted.

The Chemistry peer evaluator identified concerns with some radiation/contamination control practices being used by personnel during sampling and analysis observations. The peer evaluator provided feedback to Chemistry personnel regarding these practices, including making his observation reports part of the required reading program.

These actions resulted in significant improvements in the performance of sampling and analyses.

(2) **Major improvements have been made in some test procedures based upon peer evaluators' observations of procedure walkthrough.**

Peer evaluators observed the Shut Down from Outside the Control Room drills performed by each Operating Control Room Crew. Various procedural problems were identified by peer evaluators and submitted to the Operations Section. This resulted in the revision of applicable PNPS procedures.

(3) **Peer evaluation of training has identified some training library reference materials that needed updating. This material has been updated.**

During a simulator training observation, a peer evaluator noted an outdated copy of Technical Specifications in use on the simulator. This evaluation finding resulted in a Records Management Group review of the methods of tracking revision entries and improvements to ensure all document updates are received and implemented. Other Training Department reference library materials were updated as a result of this review.

The following examples of observations of the peer evaluators illustrate the trends or indicators that warrant additional management attention:

(1) **Problems have been identified in some maintenance procedures.**

A Maintenance peer evaluator observed a snubber disassembly operation and identified that the related procedure lacked sufficient detail on directions and parts identification.

The Instrumentation and Control (I&C) peer evaluator identified the need for validating a valve testing procedure. In addition, an I&C procedure was identified as lacking sufficient information concerning test instrument type and

accuracy requirements. Other procedural problems of this type have been identified as the result of observations in the field.

(2) **Problems have been identified in duplication of some maintenance paperwork and some cases of inadequate status information of some maintenance work.**

Observations have resulted in identifying four duplicate MRs that were generated for an inoperable snubber. Inefficient documentation of these MRs sent personnel to do work on snubbers that had already been done under other MRs and, in one case, work on snubbers that had been replaced under other documentation.

(3) **Some instances have been identified showing a lack of sufficient supervisory or management control.**

During radiological protection evaluations, many problems have been identified regarding the use of clean tools in contaminated areas, as opposed to using tools issued by the Contaminated Tool Crib. This resulted in unnecessary generation of contaminated waste. Workers were noted abandoning tools at the check points rather than retrieving them after frisking and returning them to use. Most tools checked out from tool cribs are not returned. Other supervisory management control problems identified include: pre-job briefing not given to a maintenance crew; failure of technician to immediately inform supervisor of a discrepancy during performance of a procedure; and inadequate assignments given to Security members.

3. Assessment of Peer Evaluator Process

The Team has concluded that the peer evaluation process is a valuable tool to facilitate the assessment process and is a useful adjunct to existing line management monitoring programs.

B. Management Monitoring Program

The management monitoring program is now designated the monitor watch program. As it is presently structured, it has been shown to be effective in identifying material problems and housekeeping issues. One valuable result from the management monitoring program is that a number of the personnel responsible for correction of material problems and housekeeping matters participate directly on the monitoring team so that corrective actions are initiated more rapidly.

Over 100 specific plant-remedial actions have been initiated through this process in the last three months. This process will continue.

C. QA Surveillance Monitoring Program

1. Process

In 1984, the surveillance monitoring program was initiated with one individual assigned to this effort. In 1985, a second individual was assigned. The program was further strengthened in late 1986 and reached full complement with eight engineers in September 1987. Each engineer is certified as a lead auditor per ANSI N45.2.23 and the division is staffed to provide expertise in a variety of disciplines such as operations, fire protection, radwaste, radiological protection, chemistry, electrical, and security.

A monthly surveillance schedule is issued by the Surveillance Division Manager. Backshifts are included.

Emphasis is placed on identified weaknesses in PNPS and in other plants. When areas of concern are identified during the period, unscheduled surveillances are assigned. The surveillances are both compliance-to-procedure and performance-based. Surveillance checklists are prepared considering PNPS procedures, INPO guidelines, NRC criteria, and current industry standards (American Society of Mechanical Engineers (ASME), etc.).

The surveillance monitoring personnel document the surveillance results on the pre-prepared checklists and a report is issued. Items of concern that are not resolved prior to the end of the surveillance are documented using the PNPS corrective action process. Deficiency reports (DRs) are issued for conditions contrary to management policies or procedures, regulatory requirements, or established Boston Edison commitments. Action Items are issued for matters requiring further investigation or clarification in order for the QAD to ascertain whether existing conditions are acceptable or deficient. Recommendations are issued to obtain action on potential improvements for QA program-related activities.

At the end of each month, a trending report is issued to all departments. The report summarizes the activities and findings during the month.

2. Results of Surveillances

The following is an example of observations of the surveillance engineers that illustrate a trend that warrants additional management attention:

- Surveillances conducted of the Equipment Qualification Program implementation resulted in the issuance of various deficiency reports during the first quarter of 1988. Work was stopped to investigate and correct the cause of these deficiencies.

The following are examples of observations of the surveillance engineers that illustrate positive trends:

- Improvements in the chemistry area include more prompt transmittal of chemistry records to Document Control, use of newly installed sample panels, new instrumentation for ion chromatography and atomic absorption/plasma emission spectroscopy, and the use of computer-based trending/data management.
- Improved dose tracking through continuing Radiation Work Permit use and a reduction in the number of Radiation Protection (RP) control stations in the plant, has contributed to the overall enhancement of RP.

3. Assessment of Surveillance Monitoring Process

The surveillance monitoring group has identified important areas for improvement, including the site management response to surveillance findings. Through the efforts of senior management and the introduction of the weekly QA interface meeting with site managers, response has improved and is now good.

The Team has concluded that the QA surveillance monitoring program is a valuable tool to facilitate the assessment process and is a useful adjunct to existing line management monitoring programs.

IV. ORGANIZATIONAL AND PERSONNEL CHANGES

In the Restart Plan, Chapter II, Boston Edison committed to a stronger Nuclear Organization, as indicated by an increase in nuclear management experience with a proven track record and a plan for orderly transition to a sound, long-term organization. As of July 1987, when the Restart Plan was issued, Boston Edison had already taken the initial actions described in Chapter II to increase its nuclear management experience base and augment its organizational structure. As the Restart Plan was implemented, Boston Edison developed a specific plan for transition to a long-term organization and proceeded to implement essential elements of that plan. Boston Edison brought in additional personnel with substantial nuclear experience to man key positions in the long-term organization. This Chapter summarizes: (A) the long-term organizational structure; (B) personnel and experience level additions for the long-term organization; and (C) the evaluation of organizational structure and personnel changes as they affect readiness for restart.

A. Long-Term Organizational Structure

The organizational structure for Boston Edison's long-term nuclear organization is depicted on Figure 1, which appears at the end of this chapter. This organizational structure is functioning effectively and represents the product of extensive reviews and deliberations among the Nuclear Organization Management during the fall of 1987. It is supported by detailed

position descriptions for most key positions within the organization. While adjustments will continue, this basic structure will be used.

The principal changes which have been made to the organization which was in place when Chapter II of the Restart Plan was completed are summarized in the following discussion.

The position of Vice President - Operations was abolished, the equivalent position of Station Director was created to report directly to the Senior Vice President - Nuclear, and the Station Director position was filled. Four essential plant functions -- Plant Support Department, Plant Department, Planning and Outage Department, and Nuclear Training Department -- were assigned direct reporting responsibility to the Station Director.

Under the Plant Department, the three plant operational and support functions which demand the most immediate responsiveness to operations were, consistent with maintaining a manageable span of control, assigned direct reporting responsibility. These functions are: Operations (including Chemistry); Maintenance; and Technical (including the Systems Engineering Division).

The position of Plant Support Manager was established to provide coordinated control over the Fire Protection Division and the Security, Radiological, Facilities, Procedures, and Materials Management Sections. In June 1988, the Procedures group will be transferred to the Training Department in order to more closely couple procedure content with curriculum.

The Nuclear Training Department was internally restructured to increase staffing levels, to decrease the span of managerial control, and to incorporate the self-assessment function. In addition, the Nuclear Training Department was realigned to report directly to the Station Director.

The Planning and Outage Department was strengthened by transferring the Planning and Scheduling Divisions and the Construction Management Division into this Department. The functions of the former Planning and Restart Organization were, as contemplated by Chapters II and III of the Restart Plan, integrated into the permanent organization.

The former Planning and Restart Organization was comprised of the following four branches:

(1) Work Authorization and Control;

(2) Planning and Estimating;

(3) Material Readiness; and

(4) Work Progress Monitoring.

The former Work Authorization and Control Branch had the responsibility for screening, prioritizing, and tracking work items. This function has been transferred to the Planning and Outage Services Section of the Planning and Outage Department.

The former Planning and Estimating Branch was comprised of three sections: (1) Planning and Scheduling, (2) Cost Control, and (3) Estimating. The responsibilities of the former Planning and Scheduling Section for preparing, updating, and revising work scopes and plans, including the Long Term Plan,

have been assumed by the Planning and Outage Department. Cost control, including budget estimates, is now the responsibility of the Business Planning and Budget Control Department. The former Estimating Section prepared the detailed work scopes and estimates. The Planning and Outage Department now obtains cost estimates from both the Business Planning and Budget Control Department for labor rates and from the Materials Management Section of the Plant Support Department for material costs.

Responsibilities of the former Material Readiness Branch included tracking and managing material items. These duties are now being performed by the Materials Management Section of the Plant Support Department.

The former Work Progress Monitoring Branch had the responsibility of tracking the actual performance of major work activities. The Outage Services Division of the Planning and Outage Department has now assumed this responsibility.

The Quality Assurance function, which formerly reported to the Vice President, Nuclear Engineering and Quality Assurance, will now report directly to the Senior Vice President - Nuclear.

Two new functions were added to the Nuclear Organization. The Business Planning and Budget Control Department provides budget and cost management functions, while a staff assistant to the Senior Vice President - Nuclear provides a dedicated personnel function to meet the particular increased demands associated with the PNPS outage and the implementation of the long-term organization.

The Senior Vice President - Nuclear's Staff was expanded to include three experienced special assistants. The responsibilities of the Executive Assistant to the Senior Vice President - Nuclear have been realigned to include strong central control and focus in the new position of Director, Special Projects, on such key matters as the Restart Plan, Power Ascension Program, Improvement Action Plans, and Nuclear Organization improvements.

Boston Edison's implementation of essential elements of the long-term organization goes beyond the Restart Plan commitment to develop a transition plan for the long-term organization. The organization is logically arrayed and narrows the spans of control within the organization to improve manageability.

B. Personnel and Experience Level Additions for the Long-Term Organization

As indicated in Chapter II of the Restart Plan, Boston Edison took a major step toward the achievement of safe and reliable PNPS restart with the hiring of a Senior Vice President - Nuclear with extensive experience and a proven track record of success in the management of nuclear activities. Shortly after the Senior Vice President - Nuclear reported, experienced nuclear managers were brought in to augment the organization in their respective capacities as Executive Assistant to the Senior Vice President and Director of Planning and Restart.

The experience levels and capabilities within the Nuclear Organization have continued to expand in parallel with the implementation of the long-term organization. Since the Restart Plan was completed in July 1987, a series of additions or reassignments were made to enhance levels of experience and expertise within the organization.

The new Station Director brings to Boston Edison more than 30 years of nuclear and management experience. Since 1980, he has been actively involved in management consultation for commercial nuclear power plant training, maintenance, and operations. His previous commercial experience included service as General Manager and Chief Executive Officer of Gas-Cooled Reactor Associates, and Supervisor of Nuclear Operations for San Diego Gas and Electric Company. His 26 year career in the Navy included service as Submarine Force Pacific Fleet Assistant Chief of Staff for Training and Readiness and Senior Instructor for prospective commanding officers.

The Plant Manager has over 17 years of experience in nuclear power plant operations, maintenance, and training. Prior to joining Boston Edison, the Plant Manager was employed as Vice President of Quadrex Energy Services, where he was involved in consulting for commercial nuclear power plants. Before that, he was Manager, Nuclear Plant Services, for General Electric. In this position, he was responsible for development and conduct of nuclear plant services and projects business. His prior experience included: Management, Special Operations Program at

the Knolls Atomic Power Laboratory; Site Manager at the Windsor, Connecticut, Pressurized Reactor Facility; Plant Manager at the D1G Nuclear Power Plant; and Operations Manager, S3G Nuclear Power Plant.

The Quality Assurance Manager has 15 years of direct, plant-specific experience at PNPS. His past responsibilities included Operations QA Engineer, Maintenance Systems Engineer, Senior Mechanical Engineer, Operational Quality Assurance Group Leader, Inservice Inspection Group Leader, and most recently, Operational Quality Control (QC) Group Leader. His successful performance at PNPS led to his promotion to QA Manager in January 1988.

The Plant Support Manager has extensive experience in nuclear energy. Most recently, for the Illinois Power Company, he was the Project Manager in the Nuclear Program Coordination Department. His Navy tenure included nuclear submarine experience as Executive Officer and Chief Engineer. He has been qualified as a reactor operator for over 22 years and he completed a Senior Reactor Operator's course of instruction on the BWR-6 plant.

The Business Planning and Budget Control Department Manager has over 20 years of experience in finance. For over six years he managed the corporate budget and cost management functions for General Public Utilities (GPU) Nuclear's nine divisions and three plant operating sites engaged in the production and generation of nuclear energy.

The Security Manager was most recently employed as the Security Department Head at GPU Nuclear Generating Station, Oyster Creek, New Jersey. Before that position, he was Commissioner of the Department of Public Safety for the State of Connecticut. All told, he has over 28 years of experience in security and related management positions.

The Operations Section Manager has more than 16 years of nuclear power experience. He has previously served as Operating Engineer, Reactor Engineer, Supervisor of the Independent Safety Engineering Group, Station Nuclear Engineer, and Plant Engineer at Shoreham Nuclear Power Station on Long Island. He is a graduate of the U.S. Naval Academy, and served as Command Duty Officer, Officer of the Deck, and Engineering Officer of the Watch on fossil and nuclear powered ships. He was a licensed Senior Reactor Operator at Shoreham and a qualified Shift Technical Advisor also at Shoreham.

The expertise of the Senior Vice President - Nuclear's Staff has been enhanced. With the reassignment of the former Executive Assistant as Special Projects Director, the Senior Vice President - Nuclear also brought in and assigned as a Special Assistant an individual with more than 25 years of nuclear management experience, including service as a direct report to the Director, Division of Naval Reactors, United States Atomic Energy Commission, and service in senior nuclear engineering management positions for several nuclear utilities. In addition, an individual with more than 25 years of naval nuclear

experience, including nuclear submarine commands and responsibility for readiness of more than 30 submarine crews, was brought in as a Special Assistant and subsequently assigned as a Special Projects Program Manager.

The Maintenance Section has added the new position of Deputy and has hired to fill that position an individual with approximately 25 years of direct experience in production and planning for nuclear repair, overhaul, and refueling work. The Deputy's experience spans the full range from service as an entry-level machinist, to supervisor of machine shop operations, and finally as senior manager in charge of nuclear production and planning at one of the nation's major naval shipyards. In addition, the new Mechanical Maintenance Division Manager, who has more than 15 years of nuclear experience, transferred from the QA Department, where he had worked as both a QC engineer and a QA engineer.

Consistent with the Nuclear Organization's basic policies, the Maintenance Section has also undertaken priority efforts to eliminate reliance on contractor positions, and to fill permanent Boston Edison positions within the Section. As described in Chapter II.B.3. above, 32 additional permanent Boston Edison positions have recently been authorized and aggressive efforts are under way to fill those positions at the earliest practicable time.

The basic policy of reducing contractor reliance and building the permanent Nuclear Organization has yielded positive

results. The number of contractor personnel at PNPS has been reduced from 1820 as of July, 1987, to approximately 440 as of May 14, 1988. By the end of 1988, this number of contractors is projected to drop to approximately 245. These numbers include the contractor guard force which, at the end of the year will be approximately 120.

The capability of the Nuclear Organization for effective self-assessment on an ongoing basis has been enhanced by recent additions to the Nuclear Safety Review and Audit Committee (NSRAC). The new Chairman was formerly the principal deputy to the Navy's Chief of nuclear propulsion activities, and has over 30 years of relevant experience. Five more individuals with similarly extensive backgrounds in naval and commercial nuclear power operations, engineering, and management have also recently joined NSRAC.

In summary, the additions of personnel and experience to the Nuclear Organization have been substantial since the Restart Plan was developed. This augmented experience and expertise, coupled with the restructured long-term organization, establish the bases for permanent improvement.

C. Evaluation of Organizational Structure and Personnel Changes

Boston Edison's evaluations of organizational structure and personnel have produced a series of positive indicators that directly reflect the progress that has been made in upgrading the capabilities and professionalism of the organization. These

evaluations have also identified several areas where additional management attention will be required. Brief summaries of each follow.

1. Positive Indications

The operators have shown significant improvement in knowledge, performance, communications, and demeanor. Recent excellent performance has included improved performance in simulator exercises and the use of formal communications, and in Control Room demeanor and discipline.

The activities of the organization in regard to development of Emergency Operating Procedures have been effective. The joint efforts among Operations, Training, and Engineering reflect strong teamwork and an appreciation of high standards of excellence by all concerned. Reviews by the NRC and other outside auditors have confirmed the quality of this effort.

Engineering remains a strength at PNPS. The Safety Enhancement Program (SEP) stands out in the industry as a noteworthy initiative and the quality of the effort has been recognized by the NRC.

The Systems Engineering Division (SED) is taking hold as an effective force at PNPS. The strong interface with Operations and their expanded role in maintenance planning are noteworthy.

The Quality Assurance Department (QAD) is a strength at PNPS. There is a growing sense of teamwork between key senior Station Organization management and the QAD. The elevation of

the QAD manager to report directly to the Senior Vice President - Nuclear should further enhance the effectiveness of this function.

Boston Edison has succeeded in lifting the order modifying the PNPS license and in implementing the Radiological Action Plan (RAP). More importantly, the interface between Maintenance and Radiological has been improved. Radiological controls now are more readily built into the work process, and there is less need for emphasis on the enforcement function for radiological controls. While much work remains, the basic change in attitudes toward radiological controls has been initiated and relevant performance indicators show positive trends.

The Nuclear Training Department has implemented an improvement action plan. Other noteworthy initiatives include an in-house training program for newly hired exempt employees. Outstanding achievements include the 100 percent pass rate on recent NRC operator licensing examinations.

2. Areas Requiring Additional Management Attention

The newly authorized permanent complement of 32 additional Boston Edison employees for the Maintenance Section will be filled on a priority basis. The Station Director and Plant Manager will continue to pay particular attention toward assuring that actions to reorganize, augment, and upgrade the maintenance organization are effectively and timely implemented.

The Planning and Outage Department vacancies will be filled with permanent employees on a priority basis.

Radiological and Chemistry Section manning levels will be examined and monitored closely to assure that these sections will be adequately staffed during power ascension and operations.

Continued management attention will be directed to making permanent appointments (through hiring or promotion) to the positions of Planning and Outage Manager and Maintenance Section Manager. A plan to fill the function of Radiation Protection Manager with a Boston Edison employee meeting the qualifications of Regulatory Guide 1.8 will be developed and implemented.

While the quality and experience of personnel are strong and the organization structure is sound, continuing attention will be paid to team building, communications, and control of interfaces. Attention will be given to defining and authorizing the full personnel complement of the Nuclear Organization.

During the course of the current outage, Boston Edison nuclear management determined that an extraordinary effort was needed to ensure that the workforce became fully informed of the extensive changes in programs, equipment, and policies at PNPS. Boston Edison initiated a six-week Workforce Information Program (WIP) that began on April 11, 1988. The purpose of this program is: (1) to keep Station employees informed of progress toward restart and the pursuit of excellence; and (2) to encourage two-way communication by soliciting from employees, in small group discussions, their concerns, and/or problems and/or suggestions.

Information for the WIP is being presented using bulletin board postings, F.Y.I. Bulletins, Newsbreak, All Hands Meetings, and most importantly, Work Group Discussion Meetings. This program has emphasized matters such as the SEP, operator performance with EOPs, and the need for formal communications in operations, and held those matters up to the organization as examples of the desired standard of excellence to be sought in PNPS activities. Feedback has been so positive that the program will be extended bi-weekly for an additional 12-week period.

3. Conclusions

On the basis of the foregoing, Boston Edison concludes that:

- The plan for transition to a long-term organization has been developed and essential elements of the long-term organization have been implemented.
- Substantial management experience and expertise have been added to the organization in key positions. A strong, effective management team is in place; although full Boston Edison manning of the expanded maintenance section is still required.

- Particular attention is being directed toward assuring that actions to reorganize, augment, and upgrade the Maintenance Section are effectively and timely implemented.
- Important items which will receive continued attention are: (1) making permanent appointments (through hiring or promotion) to the positions of Planning and Outage Manager and Maintenance Section Manager; and (2) defining and authorizing the full personnel complement of the Nuclear Organization. A plan to fill the function of Radiation Protection Manager with a Boston Edison employee meeting the qualifications of Regulatory Guide 1.8 will be developed and implemented.

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

REV. 5/25/88

FIGURE 1 (SHEET 1)

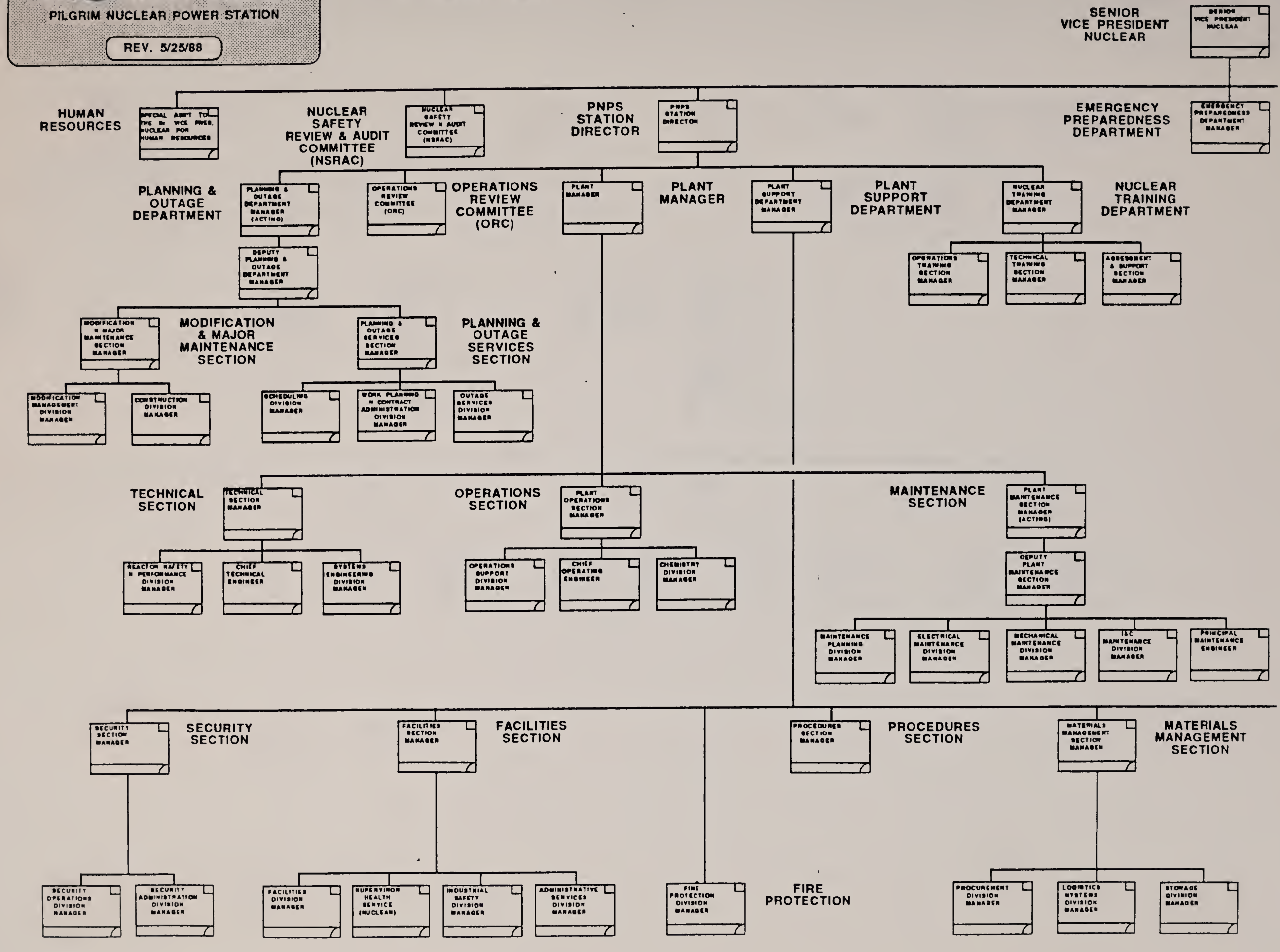
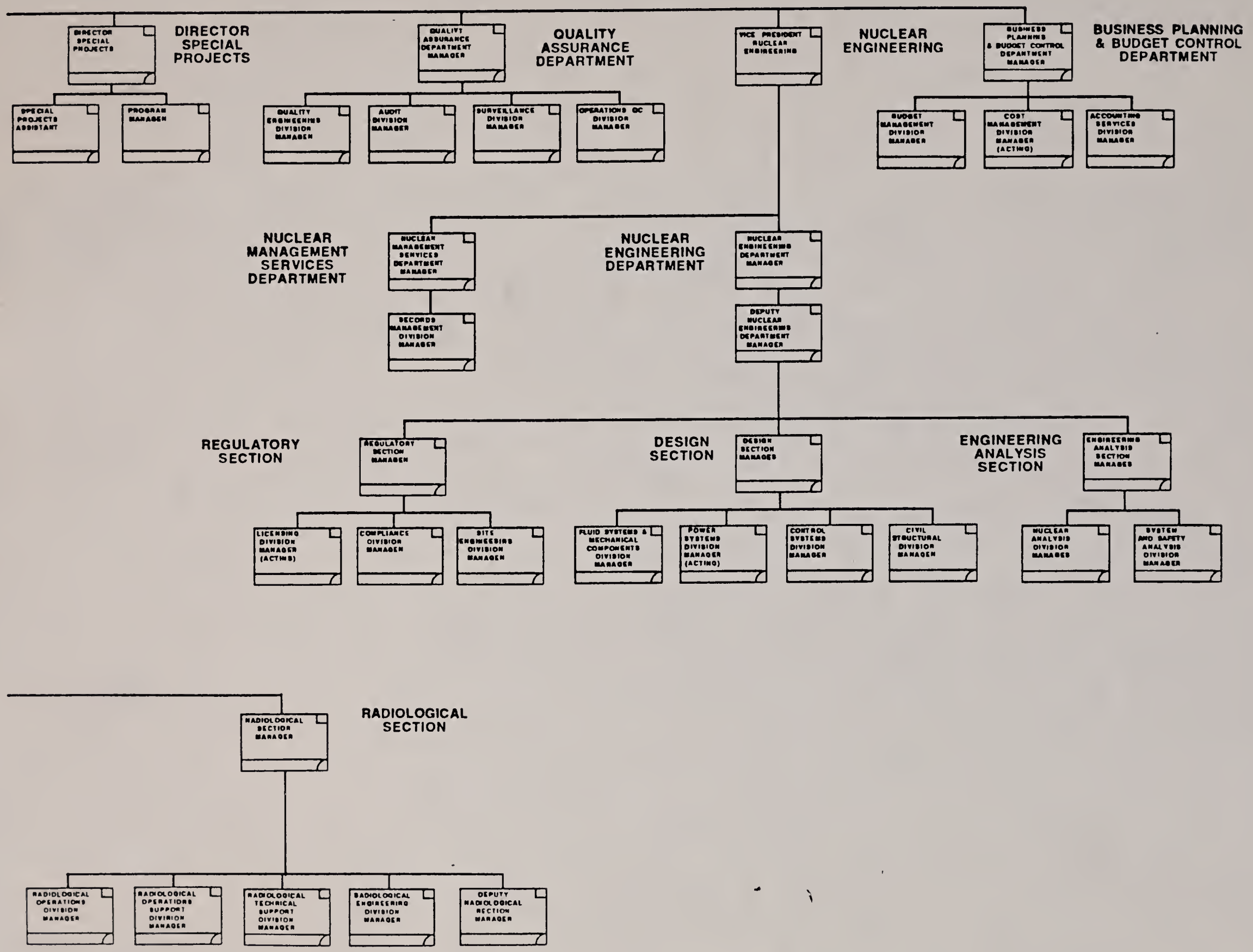


FIGURE 1 (SHEET 2)

CLEAR ORGANIZATION

REV. 5/25/88



V. BASES FOR SELF-ASSESSMENT OF READINESS FOR RESTART

As part of Boston Edison's self-assessment of PNPS performance during the development of the Restart Plan, a review by Nuclear Organization senior management defined and articulated the bases that Boston Edison planned to use for conducting its self-assessment of PNPS readiness for restart. These bases dealt directly with the concerns expressed in previous NRC inspections, including: (1) staffing; (2) work backlog; (3) responsiveness to regulatory issues; and (4) timeliness and effectiveness of corrective actions. Nuclear Organization senior management has again reviewed those bases as part of the RRSA and has confirmed their validity and applicability. The NRC Staff also acknowledged, in a May 6, 1988 letter, the viability of the Restart Plan and accepted it as a suitable framework for responding to the NRC's request for a self-evaluation of restart readiness.

The seven primary bases that Boston Edison selected for its self-assessment of PNPS readiness for restart are as follows:

At the Time of Restart

"A. Management will have executed its plans for RFO-7 work.

B. Staffing levels will be adequate to support safe and reliable restart and continued operation, and a plan for orderly transition from the restart organization to a long-term organization will be established.

C. Pertinent performance indicator trends for RFO-7 work, including backlog work, will show that management control has been established.

D. Self-assessments will have been performed and action plans established, including comprehensive action plans addressing material condition (including maintenance) and radiological controls, to assure that management control will continue.

E. Regulatory issues will have been addressed.

F. Systems group reviews will have been completed and restart actions identified for those reviews will have been closed or specifically scheduled in the approach to start-up.

G. The RFO-7 Power Ascension Program, including NRC hold points, will have been established."

The processes and results of the RRSA have confirmed the appropriateness and viability of the Restart Plan. Only limited changes to the Restart Plan description are necessary to reflect current implementation at PNPS. These changes are reflected in Chapter IV above, (changes to organizational structure and personnel) and in Chapter V.A.1., V.B.1., and V.D.2. below, (changes to Restart Plan Chapters II, III, and IV implementation). Changes to the Restart Plan, Vol. 2, Appendix 10 are identified in Appendix 11 of Vol. 2, Rev. 2.

Based upon the RRSA, Boston Edison's evaluation and conclusions concerning readiness with respect to each of the foregoing bases are summarized in the succeeding portions of this Chapter.

A. "Management will have executed its plans for RFO-7 work."

A summary of Boston Edison's evaluation and conclusions for each constituent part of this assessment basis is presented below.

1. "Boston Edison's actions to improve management, as described in Chapter II, will have been implemented."

Chapter II of the Restart Plan set forth a series of plans and actions that incorporated the following basic elements:

"a. A strong corporate commitment to improvement, as indicated by:

1) Adequate resource (financial and manpower) commitments;

2) The continued involvement and support of senior corporate management;

3) A well-defined mission for the Nuclear Organization; and

4) Challenging but achievable goals for each major component of the Nuclear Organization.

b. A stronger Nuclear Organization, as indicated by:

1) An increase in nuclear management experience with a proven track record;

2) An improved capability for planning, scheduling, and work control;

3) Realignment of organizational functions;

4) Improved technical and administrative support; and

5) A plan for orderly transition to a sound, long-term organization."

The RRSA affirmed the validity of the essential elements of Chapter II of the Restart Plan and, with the exceptions noted below or in the Restart Plan, Vol. 2, Rev. 2, Appendix 11, found that the elements had been implemented. It was evident that the elements of the Restart Plan, Chapter II, relating to corporate commitment to improvement were and remain satisfied. The April 1, 1988 revision of the 1987 Mission, Organization and Policy Manual (MOP) reinforced this commitment by articulating and emphasizing the nuclear ethic. While Boston Edison's Board of Directors will ultimately review the final state of readiness for restart and authorize Boston Edison's request, recent reviews of the current state of readiness by committees of the Board were favorable and resulted in an expression of continued strong support for Nuclear Organization management.

Based upon the RRSA, it was evident that most elements of the Restart Plan relating to a stronger Nuclear Organization were and remain satisfied. As discussed in Chapter IV of this report, Boston Edison has gone beyond Chapter II of the Restart Plan and has not only developed a plan for transition to the long-term organization, but also has implemented essential elements of the long-term organization. The changes to the organizational structure and key management personnel, relative to the structure and personnel described in the Restart Plan, Chapter II, are described in Chapter IV of this report. Particular management attention will be required to assure effective teamwork. Positive signs that a real commitment to excellence has penetrated the organization include:

(1) Operator performance in responding to off-normal events on the simulator. Recent inspections by the NRC and other independent reviews have been favorable.

(2) Operator decorum and formality in the Control Room. While the technical competence of PNPS operators has been a traditional strength, operators have had special training in communications on the simulator and formality in communication has become an intrinsic part of standard practice.

(3) Increasingly effective interfaces between key elements of the organization. The SED is playing a vital role in serving the needs of Operations and Maintenance. Similarly, the interface between the Radiological and Maintenance Sections has been improved, largely by assigning personnel trained in radiological controls to the Maintenance Section so that effective radiological controls are built into the maintenance work process itself. In addition, the interface between QA and Operations, Maintenance, and Support functions has been improved.

While an improved capability for planning, scheduling, and work control has been developed, the discussion below indicates a need for continued management attention to its implementation.

Chapter II of the Restart Plan contemplated that each Nuclear Organization Department and Section would develop its own set of goals and corresponding action plans and schedules to monitor progress against the achievement of its goals. The development and monitoring of goals at the Department level has been sufficient to provide direction to the organization without additional tracking systems. In addition, goal development and tracking at the Section level and below is not now considered necessary.

2. "An improved planning and work control system will have been implemented as described in Chapter III.F."

The current planning and work control system is adequate to support restart. While the major fundamental elements of an effective system are in place, in accordance with the MCIAP, continued management attention will be required to improve its implementation and efficiency. Several maintenance procedures and instructions require clarification and modification in order to capture lasting improvements in work packages and the work planning process.

3. "Work specified for completion in the RFO-7 schedule, which includes modifications, preventative maintenance, and corrective maintenance, will be complete or scheduled for the power ascension phase. Appendix 2 presents the results of the assessment of this element in the form of a Level I Schedule."

Major modification work scheduled for the outage is complete. Sequenced work and testing remain and will be completed prior to restart or during power ascension as applicable. Some emergent modification work is being planned and scheduled for completion before restart. As noted in Chapter V.C. below, continued management attention is needed to further drive down the numbers of some maintenance indicators. The ongoing review of power and pre-power ascension testing under the lead of the Nuclear Engineering Department (NED) will be completed. This review is discussed in greater detail in Chapter V.G., below. Any additional testing resulting from this review will be

scheduled for completion prior to restart or during power ascension. In addition, efforts will be intensified to complete detailed schedules for surveillance testing that will be accomplished prior to restart.

B. "Staffing levels will be adequate to support safe and reliable restart and continued operation, and a plan for orderly transition from the restart organization to a long term organization will be established."

A summary of Boston Edison's evaluation and conclusions for each constituent part of this assessment basis is presented below.

1. "Boston Edison will have implemented programs, plans, and actions to improve staffing levels, experience, effectiveness and support. Chapters II and III summarize these programs, plans, and actions."

Implementation of the programs, plans, and actions summarized in Chapter II of the Restart Plan to improve staffing levels, experience, effectiveness, and support is described above in connection with Chapter V.A. and Chapter IV of this report. Chapter III of the Restart Plan stated that, in order to bring about sustained operational performance improvements, Boston Edison's plans and actions would incorporate the following basic elements:

"(1) Increased staffing and experience levels in key components of the Nuclear Organization.

(2) Improved training in key Nuclear Organization components.

(3) Upgraded Emergency Operating Procedures (EOPs) and, over the longer term, initiatives to improve other PNPS procedures.

(4) Enhanced performance assessment techniques.

(5) Review of the PNPS regulatory documentation to assure that restart commitments are properly identified and dispositioned.

(6) Improved systems for management of outage work and site work control.

(7) Improved programs, plans, and actions for assuring the quality of site work and corrective actions."

The RRSA affirmed the validity of the essential elements of Chapter III of the Restart Plan and, with the exceptions noted below or in the Restart Plan, Vol. 2, Rev. 2, Appendix 11, found that those elements had been implemented.

As discussed in Chapter IV above, and in Chapter V.B.2. below, increased staffing and experience levels have been achieved in key positions within the Nuclear Organization. A high level of management attention and priority will continue in order to attain and/or maintain staffing objectives in the planning, maintenance, and radiological areas.

As a result of reduced demands, staffing in some organizations has been reduced. There is now only one full-time radiological controls specialist assigned to the maintenance production organization. In addition, the staffing of the Radiological Technical Support Group has been reduced from approximately 20 engineers and technicians to approximately 10 as

contractor employees have been released after completion of the major modification work.

The Independent Radiological Oversight Committee (IROC) will be made a subcommittee of NSRAC and, over the long term, reduced in size. Radiological oversight will be retained as a permanent element of NSRAC.

Additional training improvements, beyond those described in the Restart Plan, are embodied in the Training Improvement Action Plan. The in-house training program for new hires is a positive indication of continued improvement, as is the excellent licensed operator pass rate on qualification exams.

Boston Edison provided supplemental SEP-related information on EOPs and associated training to the NRC. This information was discussed during NRC audits and SEP meetings in lieu of a formal supplement to the July 8, 1987 submittal to the NRC.

Upgraded EOPs have been developed and favorably evaluated by the NRC and other independent evaluators. As indicated in Chapter II.A. above, the long-term initiatives to improve PNPS procedures have been modified and will be undertaken over a two year period.

Performance assessment techniques, which were described in the Restart Plan, Chapter III, have been further refined in their application at PNPS. As discussed in Chapter V.C. below, the PET Indicators Reports have been continued and expanded. Monthly Performance Reports are issued and these reports will be

modified as priorities dictate to make them continually useful to management. The Human Performance Evaluation System is in the initial stages of implementation, and with continued management attention, it offers promise as an improvement tool. The management monitoring program, now known as the monitor watch program, has been modified in scope and types of personnel involved. This has resulted in a more flexible program that uses a multi-disciplinary team to review areas selected by the Station Director.

Boston Edison's Restart Regulatory Response data base did not include a definition of suggested NRC closure actions because the NRC's inspection and review processes defined those actions without need for such suggestions. Restart commitments have been defined and appropriate changes have been identified to the NRC in Appendices 10 and 11, respectively, of the Restart Plan, Vol. 2.

Improved systems for management of outage work and site work control have been developed and are available to the Nuclear Organization. Continued management attention is needed to assure effective implementation.

Improved programs, plans, and actions for assuring the quality of site work and corrective actions are in progress. In addition, initiatives within the line organization show positive indications. For example, effective critiques were conducted for a series of events, including the loss of power event and the work control events in November 1987. As indicated in Chapter

II.A.3. above, the critique process will be institutionalized before restart. The SED has made a positive contribution in enhancing the capabilities for and performance of root cause analysis. In addition, the SED interface with Maintenance has had and will continue to have a positive influence on the quality of maintenance work. The effectiveness of corrective actions in the security area is evidenced by the reduction in security compensatory measures and the consequent elimination of the need for tracking of compensatory measures and generating of weekly reports for management.

2. "Staffing levels will be adequate to support safe and reliable restart and continued operation, as follows:

   a. A sufficient number of licensed operators will be available to man four shifts during start-up and power ascension. Over the longer term, the goal of manning six shifts will be achieved. Appendix 3 in Volume 2 presents the results of Boston Edison's projections of licensed operator resources from June 1987 for the period of time extending through December 1988. As discussed in Chapter IV.J., licensed operator resources during start-up and power ascension will be concentrated by providing an additional senior licensed operator and a management presence."

The results of the RRSA review indicated that this assessment basis has been met. Appendix 3 to Vol. 2, Rev. 2 of the Restart Plan shows that current projections of licensed reactor operator resources are such that Boston Edison will continue to meet this basis.

b. "In the areas of maintenance supervision, security, fire protection, radiological controls, and technical, adequate complements will be established and vacancies will be minimized. The data will be presented in Appendix 4."

The current data, which are presented in Appendix 4 to Vol. 2, Rev. 2 of the Restart Plan, show that this assessment basis has been substantially met. A high level of management attention and emphasis will continue in order to attain and/or maintain staffing objectives in the planning, maintenance, and radiological areas. Particular attention will be placed on hiring permanent Boston Edison employees to fill 32 new maintenance positions.

3. "A plan for orderly transition from restart to a long term organization will be established.

a. Boston Edison has made the commitment of resources and continuing senior management involvement necessary to achieve and maintain an excellent organization over the long term. These commitments are presented in Chapter II of this report."

This assessment basis has been met. As indicated under Chapter V.A.1. above, the corporate commitment elements of the Restart Plan have been maintained. The long term organization plan, described in Chapter IV above, reinforces these commitments. The Nuclear Mission Statement in the 1987 MOP was revised in April 1988 to emphasize the nuclear ethic, further reinforcing these commitments.

b. "Boston Edison has augmented its organization by bringing experienced managers into key Nuclear Organization positions. The augmented structure and staff of the Nuclear Organization, as of July 30, 1987, are presented in Chapter II and III.A. of this report."

Chapter IV of this report indicates that this assessment basis has been met.

c. "Boston Edison will establish a plan for continuing improvement in its organization and for orderly transition to a long term organization. This plan is committed to in Chapter II.A. and the Material Condition Improvement Action Plan (MCIAP)."

As discussed in Chapter IV of this report, the plan for organizational improvement and orderly transition to a long-term organization has been developed and the essential elements of the long-term organization have been implemented.

d. "Boston Edison will monitor the implementation of its long term organization by adherence to the following principles:
(1) Overtime will be maintained within Company policy limits as described in Chapter III.A.2."

Experience in 1988 shows a positive trend and current good management control in enforcing company policy limits.

(2) "The use of contractors to fulfill the functions of permanent Boston Edison positions will be minimized as discussed in Chapter II.A."

The objective of minimizing the use of contractors in Boston Edison functions has been substantially met. The number of contractors at PNPS has been reduced from 1820 as of July 1987, to approximately 440 as of May 14, 1988. By the end of 1988, the number of contractors is projected to drop to

approximately 245. These numbers include a contractor guard force which will be reduced to approximately 120 persons by the end of 1988.

(3) "The backlog of work, as measured by Boston Edison's Performance Excellence Team (PET) program performance indicators, will be maintained within the range of established goals. The PET Program is described in Chapter III.D. and the results of the PET program performance indicators are presented in Appendix 5."

As discussed under Chapter V.C. below, the backlog of work, as measured by PET program performance indicators, shows a positive trend. Total MRs, restart MRs, and security-related MRs still need full attention and will be further driven down by aggressive management action.

C. "Positive trends in pertinent performance indicators for RFO-7 work, including backlog work, will show that management control has been established."

Management control is considered to be established because the results of the following performance indicators are within the range of respective goals for each indicator:

Indicator	Goal	5/23/88 Status
Reload Systems schedule	100% of milestones scheduled	100%
Total open MRs	1000	1955 (* 1248)
MRs required for Restart	0	513 (* 122)

Open power block related MRs (INPO definition)	500	406
Open Fire Protection and Security MRs (corrective maintenance)	40(FP) 20(Sec.)	46 29
Open Deficiency Reports (DRs)	20	31
Overdue DRs	0	0
Non-Conformance Reports (NCRs) - Power Block	0	5
Radiological Occurrence Reports (RORs)	[see discussion below]	10
Plant Decontamination	90% accessible floor area clean	89.75%

* MRs that still require physical work.

As used throughout this report, the term "goal" is not intended as a go/no-go acceptance criterion. It is intended to have the dictionary meaning: "the end to which effort is directed." In this sense, Boston Edison's goals are intended to guide its efforts, and if performance falls reasonably within the range of a goal, or if trends toward the goal are positive, a positive management assessment of performance would be indicated.

As of December 1987, 100 percent of the milestones scheduled for reload, for vessel assembly, for hydrostatic testing, and for integrated leak rate testing (ILRT) had been completed. The reload systems schedule work, which was selected

as the indicator, was completed in support of the beginning of reload on September 29, 1987.

The number of total open MRs has declined by a net amount of approximately 1500 over the last 10 months to the present level of approximately 2000. (This includes new MRs identified during this period). Of these MRs, approximately 700 are designated for closure during testing and system turnover prior to and during power ascension. Therefore, only approximately 1300 MRs remain to be closed during the normal course of business outside of testing and turnover. Although the trend of this indicator has been good, Boston Edison is taking aggressive action to further reduce the total number of MRs.

Since July 1987, the number of open MRs required for restart has declined by approximately 420 to a current total of 513. The majority of these, 383, are now field-complete and will be closed during testing and system turnover prior to and during power ascension. The remaining 122 MRs are not now field-complete but will also be closed during testing and system turnover prior to and during power ascension. The overall trend of the restart MRs has been good, but additional management attention is being focused on this work to ensure that all necessary MRs are closed on a schedule to support PNPS restart.

The INPO definition has been used to define the indicator designated "open power block related MRs." Both the trend and the overall result of this indicator have been good. Since July 1987, when there were approximately 650 open power

block related MRs, the number has declined to below the goal of 500 or fewer. The present number of open power block MRs, 406, is well within the goal.

Fire protection and security MRs were selected as indicators of the status of corrective maintenance. The number of fire protection MRs has been reduced from approximately 80 in July 1987, to a number ranging between 30 and 50 in April and May 1988. Therefore, both the trend and the absolute number of the indicator suggest that the relevant performance is adequate to support restart. The results of the open security MR indicator, within the last several months, have indicated a trend in the direction of the goal. Aggressive management action is being taken to ensure that the indicator remains reasonably within range of the goal for restart.

The number of open DRs has been reduced from 45 in July 1987, to 23 in May 1988. The trend has been a positive one and the present number is reasonably within range of the goal. Overdue DRs have also been tracked as an indicator of management responsiveness to identified problems. The present number of 0 meets the restart goal. Within the past three and one-half months there has been only one overdue DR, and it was cleared in four days including a weekend.

Power block NCRs have been reduced from approximately 300 in July 1987, to 5 as of May 23, 1988. The goal for this indicator is 0 at restart. The remaining five NCRs are scheduled to be cleared prior to restart.

A favorable trend is indicated by the fact that work to reduce DRs and NCRs was largely accomplished by Boston Edison personnel while contractor personnel were being phased out.

Issuance and closure of RORs were initially tracked as the number of open RORs per 150 people onsite. The indicator was at slightly over 3 in July 1987, and was reduced below 3 by February 1988. As of February, the indicator was redefined as an absolute number which declined from approximately 100 in February to 10 as of May 23, 1988. The ROR indicator was redefined to make it consistent with the industry's (INPO's) indicator, and because the number of people entering the Radiologically Controlled Area does not change appreciably with the number of people on site. In addition, since July 1987, Boston Edison has lowered the threshold for initiation of an ROR, so that RORs are now generated for events that would not have been reported previously. Despite the lower threshold for ROR initiation, the indicator has a marked downward trend, indicating positive performance results.

The final performance indicator selected in the Restart Plan relates to plant decontamination, and consists of the percentage of accessible floor area that can be entered in street clothes. An extensive decontamination effort has increased the clean accessible floor area of PNPS from 52 percent in July 1987, to 89.75 percent in May 1988. This is a positive trend and a result reasonably within range of the goal of 90 percent.

In summary, the performance indicators show a positive trend. The number of total MRs, restart MRs, and security-related MRs still need full attention and will be further driven down by aggressive management action.

D. "Self-assessments will have been performed and action plans established, including comprehensive action plans addressing material condition (including maintenance) and radiological controls, to assure that management control will continue."

A summary of Boston Edison's evaluation and conclusions for each subpart of this assessment basis is presented below.

1. "Self-assessments and other actions to assure management control will have been performed or will be ongoing. Chapter III contains a description of these management programs, plans, and actions, including those for management performance monitoring, training, PET activities, planning and scheduling, and corrective actions. Upon submittal of the final edition of Volume 2 and its request for restart, Boston Edison will have completed its self-assessment."

Volume 2, Rev. 2 of the Restart Plan has been submitted with this report. Closure of 412 of 498 restart commitments is complete and the remaining items are scheduled for closure prior to restart or during the Power Ascension Testing Program. The request for restart will be submitted to the NRC upon completion of the NRC's Team Inspection and review and approval by Boston Edison's Board of Directors.

2. "Boston Edison's programs, plans, and actions to improve plant and equipment performance will have been implemented as described in Chapter IV."

Chapter IV of the Restart Plan confirmed that, in order to bring about sustained plant and equipment performance improvements, Boston Edison's programs, plans, and actions will incorporate the following basic elements:

"(1) Prioritization of the maintenance work backlog and reduction to manageable levels;

(2) An improved plan for maintenance activities to assure continued management control;

(3) Effective implementation of radiological control improvements and a specific action plan;

(4) An improvement in the conduct of fire protection activities, completion of Appendix R modifications, and reduced dependence upon compensatory measures;

(5) An improvement in the material condition of the security system;

(6) Improved conduct of surveillance testing;

(7) A set of plant operational condition change checklists for restart and power ascension;

(8) Deployment of a systems group to conduct system-by-system walkdowns and readiness reviews for restart;

(9) Closure of Confirmatory Action Letter (CAL) No. 86-10 items; and

(10) Establishment of a power ascension program, including NRC hold points."

The RRSA affirmed the validity of the essential elements of the Restart Plan, Chapter IV and, with the exceptions noted immediately below, in Chapter IV of this report, or in the Restart Plan, Vol. 2, Rev. 2, Appendix 11, found that these elements have been implemented.

Based upon the trends discussed in Chapter V.C. above, the maintenance work backlog is being reduced to manageable levels. Improvements in work controls and the corrective action process will help assure continued management control. Positive control will be promoted through the organizational structure and personnel initiatives in the maintenance area, as summarized in Chapters II.A.1., II.B.3., and IV above.

Effective implementation of radiological controls improvements is evidenced by the NRC's lifting of the Order Modifying License in January 1988. In the long term, effective implementation will be assured by execution of the RAP. Reduced demands on maintenance have enabled a reduction in the number of radiological controls specialists assigned to the Maintenance Section.

The RAP does not include either Radiological Section personnel qualification requirements or a description of improved procedures and facilities for radiological controls as originally contemplated in the Restart Plan because these elements were already included in existing documentation.

Improvements in fire protection activities are signalled by completion of Appendix R modifications, reduced

dependence upon compensatory measures, and results of NRC audits and inspections. Schedules for surveillance and the supporting rationale will be expeditiously completed to assure orderly progress toward restart.

Improvements in the material condition of the Security System are indicated by a reduction in security MRs and a reduction in compensatory measures. Recent trends noted in the NRC inspection reports are favorable. Because of the reduction in the number of compensatory measures necessary, the current prioritization of the security MRs, and utilization of the PET indicators, the tracking of compensatory measures, and generating of weekly reports which were provided to management are no longer necessary.

Greater management attention has been focused on surveillance testing and the technical data base to improve control of surveillances. The existing Master Surveillance Tracking Program (MSTP) data base is being upgraded. As indicated in Chapter II.A.4. above, efforts to develop an advanced MSTP using artificial intelligence software did not prove to be practicable. Schedules for surveillance testing, along with the supporting rationale, will be expeditiously completed to assure orderly progress to restart.

Plant operational condition change checklists have been used effectively and will continue to be used through restart.

The SED has been deployed and is a positive sign of effective support to and interface with Operations. The role of

the SED has been expanded to include support for the Maintenance Section as described in Chapter II.B.3 above. Volume 2, Rev. 2 of the Restart Plan, Appendix 12, presents summary reports of the SED activities.

The status of CAL 86-10 items is summarized in Appendix 8 of the Restart Plan, Vol. 2, Rev. 2. CAL 86-10 restart items have been addressed. The RRSA provides the self-assessment contemplated by the NRC's August 27, 1986 letter regarding CAL 86-10.

Boston Edison's letter 87-163, dated October 15, 1987, submitted the Power Ascension Program to the NRC. By letter 88-033, dated February 29, 1988, Boston Edison responded to NRC questions on the program. In accordance with a request by the NRC, a fourth NRC hold point has been added at the 100 percent power level. As indicated in Chapters V.A.3. above and V.G below, the NED review will be completed and any additional testing will be scheduled for completion prior to restart.

3. "A Material Condition Improvement Action Plan (MCIAP) will be developed and implemented in accordance with its provisions. The summary status of each action item in the MCIAP will be presented in Appendix 6."

An MCIAP has been developed and is being implemented in accordance with its provisions. Eighty-four of eighty-nine restart items are closed and the remaining items are scheduled for closure prior to restart. Appendix 6 of the Restart Plan, Vol. 2, Rev. 2 provides the current status of MCIAP items.

4. "A Radiological Action Plan (RAP) will be developed and implemented in accordance with its provisions. The summary status of each action item in the RAP will be presented in Appendix 7."

A RAP has been developed and implemented in accordance with its provisions. Just prior to issuance of the RAP, the NRC closed out the order which had modified Boston Edison's operating license. There are a total of 18 RAP action items. Four items are closed and the work on three additional items is complete with only administrative closure required. Appendix 7 to the Restart Plan, Vol. 2, Rev. 2 provides the current status of RAP restart items.

E. "Regulatory issues will have been addressed."

Regulatory issues for PNPS restart were identified in three primary sources; 1) CAL 86-10; 2) Management Meeting 86-41; and 3) Restart Regulatory Responses (Appendix 10 of the Restart Plan, Vol. 2).

1. "Confirmatory Action Letter (CAL) No. 86-10 open items will have been closed by Boston Edison or scheduled for completion."

The status of CAL 86-10 items is reported in the Restart Plan, Vol. 2, Rev. 2, Appendix 8. Those CAL 86-10 items scheduled for completion prior to restart have been internally closed. Two items are scheduled for completion after PNPS restart. These action items are long-term programs not directly related to restart requirements.

2. "Management Meeting 86-41 items will have been closed by Boston Edison or scheduled for completion."

The status of Management Meeting 86-41 items is reported in the Restart Plan, Vol. 2, Rev. 2, Appendix 9. The majority of the 86-41 items scheduled for closure prior to restart have been internally closed. However, 18 such items have not yet been closed. Their status is as follows:

8 items - completed

10 items - scheduled for completion and closure in prior to restart.

Items designated as "completed" are awaiting completion of the nonconstruction-related activities to provide closure verification.

Ten additional 86-41 items are scheduled for completion after PNPS restart. These items generally fall into one of the following four categories:

(1) Actions dependent upon test results and/or analyses of test results for definition of closure.

(2) Actions that improve or fine-tune actions already accomplished;

(3) Actions that track completion of continuing programs not required for restart;

(4) Actions that are long-term and programmatic in nature.

3. "The Boston Edison Restart Regulatory Responses described in Chapter III.E will have been closed by Boston Edison prior to restart or scheduled for completion."

The Restart Plan, Vol. 2, Rev. 2, Appendix 10 documents the status of the restart regulatory commitments. The items in the restart regulatory commitment data base are now scheduled for closure prior to or during restart and power ascension. Items previously included in the data base which are long-term and programmatic are now being tracked separately as applicable. These changes are documented in the Restart Plan, Vol. 2, Rev. 2, Appendix 11, "Changes to Regulatory Commitments."

There are 66 action items in the restart regulatory commitment data base not associated with CAL 86-10 or Management Meeting 86-41 that have not yet been closed. Their status is as follows:

27 items -	completed
20 items -	scheduled for completion and closure prior to restart
19 items -	restart (as defined in Volume 2 Rev. 2 Appendix 10 of the Restart Plan)

Documents which may contain new restart regulatory commitments made by Boston Edison have been reviewed for possible inclusion in the data base summarized in the Restart Plan, Vol. 2, Appendix 10. Items routinely reviewed include meeting minutes from NRC inspections, NRC inspection reports, and other Boston Edison correspondence with the NRC. Regulatory

commitments not included in the Restart Plan, Vol. 2, Appendix 10 are tracked elsewhere in Boston Edison commitment tracking systems.

The Restart Plan Assessment Program provides management a tool for confirming that the action items associated with each restart regulatory commitment have been satisfactorily completed and that those actions taken to resolve the programmatic restart issues have been effective. Restart action items selected for assessment met one of the following two criteria:

(1) the item required continuing action on a daily, monthly, or periodic basis; or

(2) the item resulted in developing a new program.

Using these criteria, 125 of the 524 items found in Appendix 10 were selected for assessment after closure. The majority of those items (86) were the subject of detailed assessments, but others were verified by physical walkdowns, or the documentation was reviewed and verified. Personnel assigned responsibility for performing assessments were trained in the assessment process in accordance with written guidelines developed for the program.

In general, the results of the assessment program are confirming that the action items were successful in resolving programmatic issues for restart. In approximately 10 percent of the assessments, additional beneficial actions have been identified. The assessment process has been used successfully to direct management attention to those areas requiring additional

work, while providing assurance that the items have been properly resolved and closed. Of the 86 items identified for detailed assessment, only 14 remain to be assessed as of May 23, 1988. Five of those fourteen remain to be closed by line managers and thus cannot yet be assessed.

The restart regulatory commitments as described in Appendix 10 to the Restart Plan have been reviewed to identify any changes necessary to reflect the present content and status of the commitments. Changes to the commitments are documented in Appendix 11 to the Restart Plan, along with an explanation of the need for each of the changes.

F. "Systems group reviews will have been completed and restart actions identified in those reviews will have been closed or specifically scheduled in the approach to startup."

The Systems Summary Status Reports required by the MCIAP and the Restart Plan are maintained for use by the Systems Engineers and any others reviewing systems status. System line-ups are over 70 percent complete, with approximately 45 of the 55 major systems lined up and entering service.

The System Summary Status Reports were initially developed in July 1987, and have been maintained current to date. The scope of these reports includes: (1) major system production work completed; (2) significant issues addressed; (3) outstanding system post outage work items; (4) summary of significant system testing status; and (5) outstanding comments and/or problems.

The information in the System Summary Status Reports and in their backup documentation, System Status Books, has been instrumental in managing the outage scope. The SED provides assistance in determining work priorities and elevating work through the existing planning processes such as the PNPS staff meeting, the WPRT meeting, the daily work look-ahead meeting, and the twice-per-week "System Window" Planning meetings.

The System Summary Status Reports will be submitted as Appendix 12 of the Restart Plan, Vol. 2, Rev. 2. Restart action items have been documented and are either closed, or scheduled in the approach to start-up. From a systems readiness perspective, the major plant systems already are, or will be, ready to support restart.

G. "The RFO-7 Power Ascension Program, including NRC hold points, will have been established."

The Power Ascension Program was submitted to the NRC by letter number 87-163, dated October 15, 1987. As explained in the transmittal letter, the description of the Power Ascension Program and the associated Boston Edison process for assessment of performance during power ascension were expanded beyond the level of detail originally contemplated in the Restart Plan. Therefore, the Power Ascension Program was transmitted as a separate document rather than as Appendix 13 to Vol. 2 of the Restart Plan.

The Power Ascension Program includes a description of the logic plan for testing and power ascension, Boston Edison's

assessment points, the proposed NRC approval points, the start-up organization, and the management assessment process. As the final phase of the Restart Plan, the Power Ascension Program is the mechanism by which Boston Edison will demonstrate the effectiveness of its programs, plans, and actions to assure safe and reliable restart and continued operation of PNPS.

Boston Edison responded to NRC questions on the Power Ascension Program in a letter dated February 29, 1988, and provided additional information to the NRC on the test program in a public meeting held on April 8, 1988, at the NRC's Region I offices.

Boston Edison is conducting a review of the Power Ascension Program start-up test plan to verify the accuracy and completeness of the program. An engineering design review board assisted by PNPS personnel is finalizing an intensive review of the start-up dynamic test plan.

The review used as its starting point operating transients selected on the bases of plant design, plant-specific operating experience, and initial plant start-up transient tests. The transient-by-transient, test-by-test review was designed to ascertain the completeness of the test programs and to recommend changes, if required. For each transient and potential start-up test, a number of elements were considered to predict where system and/or component behavior during the plant transient might differ from prior behavior, and therefore where dynamic testing might be warranted. Elements considered in this evaluation were

plant design changes, major maintenance work, unresolved items, and potential problems. The potential behavior changes of the most interest were the following:

(1) Plant response during transients where key plant parameters (e.g., reactor pressure) could be affected; especially if analysis predicted values could be exceeded or Limiting Condition for Operation (LCO) limits might be approached, and

(2) Unwanted outcomes which might occur during the transient (e.g., scrams or failure to scram, containment isolation or failure to isolate, etc.).

The second major step in the review process was to assess the adequacy of the test program to ensure that potential problems will be caught during testing. The types of tests considered were post-work tests, routine surveillance tests, and the dynamic tests already planned in the Power Ascension Program. The test coverage was reviewed on a transient-by-transient, response-by-response basis to determine whether it would provide assurance that the potential problem would be identified before full-power operation.

The preliminary results of the review indicate that additional transient tests during the Power Ascension Program would provide no significant benefit. During the course of the review, it became apparent that the thoroughness of post-work testing (PWT) is extremely important to a number of critical design changes and major maintenance items. Therefore, additional detailed reviews of plant PWT of selected design

changes have been initiated to establish this adequacy in assuring the affected systems will perform as designed and to determine whether any additional PWT prior to start-up should be conducted. The dynamic test review is expected to be finalized in June 1988.

The review results indicate that the Power Ascension Program start-up tests include the key dynamic tests necessary for restart and thus confirm the content of the program as originally developed. Additional post-work tests which are recommended as a result of this effort will provide additional assurance that PNPS is ready for safe and reliable operation.

VI. CONCLUSIONS

Boston Edison has concluded that, upon completion of the actions identified in the RRSA and the Restart Plan, PNPS will be ready for safe and reliable restart and continued operation.

The RRSA has confirmed the appropriateness and validity of Boston Edison's Restart Plan, which was submitted by Boston Edison on July 30, 1987. The NRC has acknowledged the viability of the Restart Plan, and accepted it as a suitable framework for responding to the NRC's request for a self-evaluation of restart readiness.

The RRSA has identified the following matters relating to plant and equipment performance, operational performance, and management and organization which show significant improvement but which require completion of specific, well-defined actions for restart: material condition and cleanliness; maintenance; planning and scheduling; plant testing and readiness; system lineups; operations performance; formality of communications; procedure adequacy; drawing completeness and accuracy; and institutionalization of site work practices. Schedules for actions to address these matters will be provided to the NRC by separate correspondence requesting commencement of the NRC's team inspection.

The RRSA found an improved performance trend in the functional areas of radiological controls, surveillance, fire protection, security, and assurance of quality, all of which were

identified as areas for increased attention by the NRC's 1986 Systematic Assessment of Licensee Performance (SALP) report (86-99). Subject to closure of remaining actions identified by PNPS line management, Boston Edison will have resolved the issues identified in the 1986 SALP report.

The results of Boston Edison's independent performance evaluations indicate that the peer evaluator process and the QA surveillance monitoring program are valuable tools that facilitate the assessment process and are useful adjuncts to existing line management monitoring processes.

The plan for transition to a long-term organization has been developed and essential elements of the long-term organization have been implemented. Substantial nuclear management experience and expertise have been added to the organization in key positions; although full Boston Edison manning of the expanded Maintenance Section is still required.

The RRSA confirmed the appropriateness and validity of the bases for self-assessment of readiness that were established in Chapter V of the Restart Plan. Those bases for assessment of readiness for restart have been substantially met.